

THE
GARDENERS DICTIONARY:

CONTAINING
The BEST and NEWEST METHODS
OF
CULTIVATING *and* IMPROVING
THE
Kitchen, Fruit, Flower Garden, *and* Nursery;

As also for Performing the
Practical Parts of AGRICULTURE:

INCLUDING
The MANAGEMENT of VINEYARDS,
WITH THE
Methods of MAKING and PRESERVING the WINE,
According to the present Practice of
The most skilful Vignerons in the several Wine Countries in *Europe.*

TOGETHER WITH
DIRECTIONS for PROPAGATING and IMPROVING

From REAL PRACTICE and EXPERIENCE

ALL SORTS OF TIMBER TREES.

THE SEVENTH EDITION,
REVISED and ALTERED according to the latest SYSTEM of BOTANY,
AND EMBELLISHED WITH
Several COPPER-PLATES, which were not in the former EDITIONS.

BY PHILIP MILLER, F. R. S.
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. . . *Digna manet divini gloria ruris.* VIRG. Georg.

VOLUME • II.

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GARDENERS' DICTIONARY;

The first and second editions
of the Dictionary of Gardening
and Horticulture

in which the names of plants, flowers, fruits, and vegetables
are explained in English, French, and Italian;

with a description of the manner of cultivating them
in the open air, and in pots, and of the manner of forcing them

in the hot-bed, and of the manner of raising them from seed
and cuttings, and of the manner of propagating them by layers

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T H E G A R D E N E R S D I C T I O N A R Y .

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M A C A L E B. See Cerasus.

M A D D E R. See Rubia Tinctorum.

M A G N O L I A. Plum. Nov. Gen. 38. Tab. 7.
Lin. Gen. Plan. 610. The Laurel-leaved Tulip Tree, vulg.

The Characters are,

The Empalement is composed of 3 oval concave Leaves, like Petals, which soon fall away. The Flower is composed of 9 oblong blunt Petals, which are concave. It hath a great Number of short Stamina, which are compressed, and inserted into the Germen, terminated by linear Summits, adhering to every Side of the Stamina. It hath many oblong oval Germina, fastened to the Receptacle, supporting recurved, contorted, short Styles, with longitudinal hairy Stigmas. The Germen afterwards become oval Cones, with roundish compressed Capsules, almost imbricated, having one Cell, opening with two Valves, inclosing one Kidney-shaped Seed, hanging by a slender Thread from the Scale of the Cone.

The Species are,

1. *MAGNOLIA foliis ovato-lanceolatis subtus glaucis annuis.* Magnolia with oval Spear-shaped Leaves, which are gray on their under Side, and annual. This is the *Magnolia lauri folio subtus albicante.* Catesb. Hist. Car. 1. p. 39. Magnolia with a Bay Leaf, which is whitish on the under Side, commonly called, Small Magnolia, or Laurel-leaved Tulip Tree.

2. *MAGNOLIA foliis lanceolatis persistentibus, caule erecto arborico.* Fig. Plant. Tab. 172. Magnolia with Spear-shaped Leaves, which are ever-green, and an erect Tree-like Stalk. This is the *Magnolia altissima flore ingenti candido.* Catesb. Carol. 2. p. 61. Tallest Magnolia with a very large white Flower, commonly called, Greater Magnolia, or Tulip Tree with a Laurel Leaf.

3. *MAGNOLIA foliis lanceolatis amplissimis annuis, petalis exterioribus dependentibus.* Magnolia with very large Spear-shaped Leaves, which are annual, and the outer Petals of the Flower declining. This is the *Magnolia amplissimo flore albo, fructu coccineo.* Catesb. Car. 2. p. 80. Magnolia with a very large white Flower, and a scarlet Fruit, commonly called Umbrella Tree.

4. *MAGNOLIA foliis ovato-lanceolatis acuminatis annuis, petalis obtusis.* Magnolia with oval Spear-shaped pointed Leaves, which are annual, and obtuse Petals to the Flower. This is the *Magnolia flore albo, folio majore acuminata, haud albicante.* Catesb. Car. 3. p. 15. Magnolia with a white Flower, and a large acute-pointed Leaf, not whitish.

The 1st Sort grows in Virginia and Carolina, and is found in moist Places, near Brooks; this usually rises about

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15 or 16 Feet high, with a slender Stem. The Wood is white and spongy, the Bark is smooth and white, the Branches are garnished with thick smooth Leaves, resembling those of the Bay, but are of an oval Shape, and smooth on their Edges; these are white underneath. The Flowers are produced in May, at the Extremity of the Branches, which are white, and composed of six Petals, which are concave; they have an agreeable sweet Scent. After these are past, the Fruit increases in Size to be as large as a Walnut with its Cover, but of a conical Shape, having many Cells round the Outside, in each of which is lodged a flat Seed, about the Size of a Kidney Bean. This Fruit is at first green, afterward red, and, when ripe, of a brown Colour. The Seeds, when ripe, are discharged from their Cells, and hang by a slender Thread.

In the natural Places of its Growth, there is a Succession of Flowers on the Trees, for two Months, during which Time the Woods are perfumed with them; but all those Trees which have Flowered in England, seldom have more than 12 or 14 Flowers upon each, which are of short Duration, and are not succeeded by others; the Leaves of this Sort fall off in Winter.

When these Trees are transplanted from the Places of their Growth into dry Ground, they make handfomer Trees, and produce a greater Number of Flowers; this is to be understood of America, for in Europe they do not thrive so well in a dry Soil, as in a moist loamy Land. The greatest Number of these Trees, which are now growing in England, are at his Grace the Duke of Richmond's, at Goodwood, in Sussex.

The 2d Sort grows in Florida and South Carolina, where it rises to the Height of 80 Feet or more, with a strait Trunk, upward of 2 Feet Diameter, having a regular Head; the Leaves of this Tree resemble those of the common Laurel, but are much larger, and are of a shining Green on their upper Side, and, in some Trees, are of a Russet, or Buff Colour, on their under Side; these Leaves continue all the Year, so that this is one of the most beautiful ever-green Trees yet known. The Flowers are produced at the End of the Branches; they are composed of 8 or 10 Petals, which are narrow at their Base, but broad at their Extremity, where they are rounded, and a little waved; these spread open wide, and are of a pure white Colour. In the Center is situated a great Number of Stamina and Styles, fastened to one common Receptacle; these Flowers are succeeded by oblong

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scaly Cones, in the Places where it grows naturally, but the Summers are not warm enough in *England* to produce any Fruit. These Trees in their native Places of Growth begin to produce their Flowers in *May*, and continue a long Time in flower, so that the Woods are perfumed with their Odour for a long Time; but those which have flowered in *England*, seldom begin till the Middle of *June*, and do not continue long in Beauty. The largest Tree of this Kind, which I have met with in *England*, is in the Garden of Sir John Colliton, of *Exmouth*, in *Devonshire*, which has produced Flowers for several Years; there are also many large Plants of this Sort in the Gardens of his Grace the Duke of *Richmond*, at *Goodwood*, in *Suffex*, one of which has produced Flowers several Years; and in the Nursery of Mr. Christopher Gray, near *Fulham*, there is one very handsome Plant, which has also produced Flowers.

As this Sort is a Native of a warm Country, it is a little impatient of Cold, especially while young, therefore the Plants should be kept in Pots, and sheltered in Winter for some Years, until they have acquired Strength, when they may be shaken out of the Pots, and planted in the full Ground, but they must be planted in a warm Situation, where they may be defended from the strong Winds, and screened from the North and East; otherwise they will not live abroad.

There were a great Number of young Plants in *England* before the Year 1739, but a great Part of them were destroyed by that severe Winter, and since then, there have been few good Seeds sent to *England*, so that there are very few of these to be purchased at present, and as almost every Person who is curious in Gardening is desirous to have some of these beautiful Trees in their Gardens, the Demand for them of late has greatly increased their Value. If this Tree can be so far naturalized as to endure the Cold of our severe Winters abroad, it will be one of the greatest Ornaments to our Gardens; and this we may hope, will, in Time, be effected, by diligent Observation and Care: The Time when these Plants suffer most, is in Autumn, by the early Frosts, for the Extremity of the Shoots being then tender, as they are then growing freely, a small Frost will pinch them, and afterward the whole Shoot frequently decays, so that the Plants should be guarded against this, by covering their Tops with Mats, until the Shoots are hardened; after which Time they will not be in so much Danger of suffering; for I have constantly observed, that if these Plants escape the early Frosts of the Autumn, they are seldom injured afterward; in the severe Winter, 1739-40, I had a pretty large Plant growing in the open Air, which I supposed was entirely destroyed, as there was not the least Appearance of Life in the Stem, so that after *Midsummer* I cut it down to the Ground, but left the Root remaining, which, to my great Surprise, shot up again the Year after. This I mention to caution People from being too hasty in destroying Plants after hard Frost, and rather to wait until there can be no Hopes of their Recovery.

The 3d Sort grows common in *Carolina*, but in *Virginia* it is rare; this usually rises from 16 to 20 Feet high, with a slender Trunk; the Wood is soft and spongy, the Leaves are remarkably large, and are produced in horizontal Circles, somewhat resembling an Umbrella,

from whence the Inhabitants of those Countries have given it this Name. The Flowers are composed of 10 or 11 white Petals, which hang down without Order; the Fruit is very like that of the former Sort; the Leaves of this Sort drop off at the Beginning of Winter.

This Tree is as yet very rare in *Europe*, but as it is propagated from Seeds, we may hope to have it in greater Plenty soon, if we can obtain good Seeds from *Carolina*, for it is rarely met with in *Virginia*.

The 4th Sort is also very rare in *England*; there are but few of the Plants at present here, nor is it very common in any of the habitable Parts of *America*; some of these Trees have been discovered by Mr. John Bartram, growing on the North Branch of *Susquehannab* River. The Leaves are near 8 Inches long, and 5 broad, ending in a Point. The Flowers come out early in the Spring, are composed of 12 white Petals, and shaped like those of the 2d Sort; the Fruit of this Tree is longer than those of the other Species, but in other Respects agrees with them. The Wood is of a fine Grain, and Orange Colour.

All these Sorts are propagated by Seeds, which must be procured from the Places of their natural Growth; these should be put up in Sand, and sent to *England*, as soon as possible; for if they are kept long out of the Ground, they very rarely grow, therefore should be sown as soon as possible, after they arrive.

Some Years past I received a Quantity of these Seeds from *Carolina*, which I sowed in Pots as soon as I received them, and plunged the Pots into a moderate hot Bed; with this Management I raised a great Number of Plants; but from the Seeds which have been lately brought over, very few Plants have been produced; whether the Seeds were not perfectly ripe when gathered, or from what other Cause this has happened, I cannot say, but it is certain the Fault must be in the Seeds, because they were differently sown and managed by the several Persons who received them, and the Success was nearly alike every where.

There have been several Plants of the 1st and 2d Sorts raised from Layers, and some from Cuttings; but these do not thrive so well as those which come from Seeds, nor will they grow to near the Size, so it is much the best Way to procure their Seeds from *America*, and propagate them that Way.

The 1st Sort frequently comes up well from Seeds, but the young Plants are very difficult to keep the two first Years, for, if they are exposed much to the Sun, their Leaves change yellow, and the Plants decay, so the best Way is to keep the Pots plunged in a moderate hot Bed, and shade them every Day from the Sun with Mats, giving them Air in Plenty when the Weather is warm, and frequently refresh them with Water; during the Winter Season they must be screened from Frost, and in mild Weather they must enjoy the free Air, to prevent their growing mouldy, and they should have but little Wet after their Leaves are fallen. With this Management the Plants may be trained up, and when they have acquired Strength, may be planted in the open Air, where they will thrive and flower, if they have a warm sheltered Situation.

The 2d Sort is not so difficult to train up, but in order to get them forward, it will be proper when they are removed out of the Seed Pots, to plant them each into a small

small Pot, filled with soft loamy Earth, and plunge them into a gentle hot Bed of Tanners Bark, observing to shade them from the Sun, and admit proper Air to them, but at *Midsummer* they should be inured to the open Air gradually, and then placed in a sheltered Situation, where they may remain till Autumn; on the first Approach of Frost, they should be removed under Shelter, otherwise the early Frosts will pinch their tender Shoots, which often occasions their dying downward after. When the Plants have got Strength, some of them may be turned out of the Pots, and planted in the full Ground, in a warm sheltered Situation, but Part of them should be kept in Pots, and sheltered in the Winter, to preserve them, lest, by severe Frost, the other should be killed.

If the Plants make good Progress, they will be strong enough to plant in the full Ground in about 6 or 7 Years. The Time for removing or shifting these Plants is in *March*, before they begin to shoot, which may sometimes happen to be too soon to turn them out of the Pots into the full Ground, especially if the Season proves late; but as there will be no Danger in removing them out of the Pots, the Ball of Earth being preserved to their Roots, so it is best to defer this till the Month of *April*; but it will be necessary to harden those Plants which are intended to be planted out, by exposing them to the Air as much as possible, for this will keep the Plants backward, and prevent their shooting; for if they make Shoots in the Green-house, those will be too tender to bear the Sun, until they are by Degrees hardened to it, and the least Frost will greatly pinch them, and such often happen very late in the Spring.

The two or three Winters after these are planted out, it will be necessary to lay some Mulch on the Surface of the Ground, about their Roots, as also to throw some Mats over their Heads, especially at the Beginning of the Morning Frosts in Autumn, for the Reasons before given; but they should never be too closely covered, lest the Shoots should grow mouldy, for that will certainly kill the leading Buds of every Shoot, and prove to the full as injurious to them as the Frost. As the Plants get Strength, they will be better able to endure the Cold of our Climate, though it will be proper to lay Mulch about their Roots every Winter, and, in very severe Frost, to cover their Heads and Stems.

It is the 2d Sort which requires the most Care, being much tenderer than any of the other Sorts, for they will endure the Cold very well, without much Care, after they have acquired Strength; for as these lose their Leaves in the Winter, the Frost will not have so much Force upon them as the 2d Sort, whose Leaves are tender toward the End of the Shoots, especially when they grow freely, or shoot late in the Autumn.

MAHALEB. See *Cerasus*.

MAJORANA. See *Origanum*.

MALABAR NUT. See *Adhatoda*.

MALA ÆTHIOPICA. See *Lycopersicon*.

MALA ARMENIACA. See *Armeniaca*.

MALACOIDES. See *Malope*.

MALA COTONEA. See *Cydonia*.

MALA INSANA. See *Melongena*.

MALLOW. See *Malva*.

MALLOW Tree. See *Lavatera*.

MALOPE. Bastard Mallow.

The Characters are,

The Flower, which is shaped like that of the Mallow, hath a double Empalement, the outer being composed of three Heart-shaped Leaves, and the inner is of one Leaf cut into 5 Segments; the Flower is of one Petal, divided into 5 Parts to the Bottom, where they are joined, but it seems to have 5 Petals. In the Center arises the Pointal, having a great Number of Stamina surrounding it, which are joined closely, and form a Sort of Column. The Pointal afterward becomes a Fruit composed of many Cells, which are collected into a Head, in each of which is lodged a single Seed.

We have but one Species of this Plant, viz.

MALOPE foliis ovatis crenatis glabris. Lin. Hort. Cliff. 347. Bastard Mallow with oval smooth Leaves, which are notched.

The whole Plant has greatly the Appearance of the Mallow, but differs from it, in having the Cells collected into a Button, somewhat like a Blackberry; the Branches spread, and lie flat upon the Ground, extending themselves a Foot or more each Way. The Flowers are produced singly upon long Foot Stalks, from the Setting on of the Leaves, which are in Shape and Colour like those of the Mallow.

This is propagated by Seeds, which should be sown in the Place where they are designed to remain, for they do not transplant well. If these Seeds are sown on a warm Border in *August*, the Plants will stand through the Winter, and flower early the following Season, so that good Seeds may be obtained; for those which are sown in the Spring rarely ripen Seeds the same Year in *England*; and these Plants being large, are often destroyed in Winter; it seldom continues longer than two Years, so that young Plants should be annually raised.

MALPIGHIA. Plum. Nov. Gen. 46. Tab. 36. Lin. Gen. Plant. 38. Barbadoes Cherry, vulg.

The Characters are,

The Flower has a small permanent Empalement of 5 Leaves, which are closed together. It hath 2 oval mellow Glands, adhering to the small Leaves within and without. It has 5 Kidney-shaped Petals, which are concave, and spread open, having long narrow Tails, and 10 broad Awl-shaped Stamina, which are erect, terminated by Heart-shaped Summits. It has a small roundish Germen, supporting 3 slender Styles, crowned by obtuse Stigmas. The Germen turns to a large furrowed globular Berry, with one Cell, inclosing 3 rough stony Seeds, which are angular.

The Species are,

1. MALPIGHIA foliis ovatis integerrimis glabris, pedunculis umbellatis. Hort. Cliff. 169. Malpighia with smooth, oval, entire Leaves, and umbellated Foot Stalks. This is the *Cerasus Jamaicensis, fructu tetrapyrreno*. Hort. Amst. 1. p. 145. Jamaica Cherry with a Fruit having four Seeds, commonly called, Barbadoes Cherry.

2. MALPIGHIA foliis ovato-lanceolatis acuminatis, glabris, pedunculis umbellatis. Malpighia with oval Spear-shaped smooth Leaves, ending in acute Points, and umbellated Foot Stalks. This is the *Malpighia mali Punici facie*. Plum. Nov. Gen. 46. Malpighia with the Appearance of Pomegranate.

3. MALPIGHIA foliis lanceolatis subtus incanis, pedunculis umbellatis alaribus. Malpighia with Spear-shaped Leaves, hoary on their under Side, and umbellated Foot Stalks proceeding from the Wings of the Stalk.

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4. *MALPIGHIA foliis cordato-lanceolatis, setis decumbentibus rigidis, racemis lateralibus.* Malpighia with Spear Heart-shaped Leaves, having rigid declining Bristles, and Bunches of Flowers proceeding from the Sides of the Stalks. This is the *Malpighia latifolia, folio subtus spinoso.* Plum. Nov. Gen. 46. Broad leaved Malpighia, with Spines growing on the under Side of the Leaf.

5. *MALPIGHIA foliis ovatis acutis glabris, pedunculis umbellatis alaribus terminalibusque.* Malpighia with oval, smooth, acute-pointed Leaves, and umbellated Foot Stalks proceeding from the Sides and Ends of the Branches.

6. *MALPIGHIA foliis oblongo-cordatis acuminatis glabris, pedunculis paniculatis, alaribus terminalibusque.* Malpighia with oblong, Heart-shaped, smooth Leaves, ending in acute Points, and paniculated Foot Stalks proceeding from the Sides and Ends of the Branches. This is the *Apoecynum fruticosum, folio oblongo acuminato, floribus racemosis.* Shan. Shrubby Dogbane with an oblong acute-pointed Leaf, and Flowers growing in Clusters.

7. *MALPIGHIA foliis lineari-lanceolatis, setis decumbentibus rigidis, pedunculis umbellatis alaribus.* Malpighia with linear Spear-shaped Leaves, rigid declining Bristles, and Foot Stalks having Umbels of Flowers proceeding from the Sides of the Branches. This is the *Malpighia angustifolia, folio subtus spinoso.* Plum. Nov. Gen. 46. Narrow-leaved Malpighia with a Leaf spiny beneath.

8. *MALPIGHIA foliis oblongo ovatis acuminatis, setis pungentibus, pedunculis unifloris verticillatis.* Tab. 181. Fig. Pl. Malpighia with oblong, oval, acute-pointed Leaves, covered with stinging Bristles, and Foot Stalks growing in Whorls round the Stalks, each sustaining one Flower.

9. *MALPIGHIA foliis oblongo-ovatis obtusis glabris, pedunculis racemosis alaribus.* Malpighia with oblong oval Leaves, obtuse and smooth, and branching Foot Stalks of Flowers proceeding from the Sides of the Branches.

10. *MALPIGHIA foliis lanceolatis dentato-spinosis subtus bispidis.* Lin. Sp. Plant. 426. Malpighia with Spear-shaped Leaves, indented and prickly, whose under Sides are set with spiny Hairs. This is the *Malpighia angustis & acuminatis aquifolii foliis.* Plum. Nov. Gen. 46. Malpighia with narrow and acute-pointed Holly Leaves.

11. *MALPIGHIA foliis subovatis dentato-spinosis, pedunculis unifloris.* Malpighia with Leaves nearly oval, indented, and prickly, and Foot Stalks with one Flower. This is the *Malpighia humilis, ilicis cocci-glandiserae foliis.* Plum. Nov. Gen. 46. Low Malpighia with Leaves like the Kermes Oak.

The 1st Sort is commonly cultivated in the *West-Indies* for its Fruit; this usually grows to the Height of 16 or 18 Feet, having a slender Stem, covered with a light brown Bark. The Leaves are produced by Pairs opposite to each other; they are oval, smooth, ending in acute Points, and continue all the Year. The Flowers are produced in Bunches upon pretty long Foot Stalks, which come out from the Side and at the End of the Branches; these are composed of 5 Petals, of a Rose Colour, and are joined at their Base. The Flowers are succeeded by red Fruit, shaped like those of the small wild Cherry, and of the same Size, each inclosing 4 angular furrowed Stones, surrounded by a thin Pulp, which has an agreeable acid Flavour; the Fruit of this very often ripens in *England*.

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The 2d Sort grows naturally in *Jamaica*; this rises with a shrubby Stalk 10 or 12 Feet high, dividing into several slender spreading Branches, covered with a light brown Bark, and garnished with oval Spear-shaped Leaves placed opposite; they are smooth, and end in acute Points. The Flowers are produced in Umbels at the End of the Branches, standing on short Foot Stalks; they are of a pale Rose Colour, and are composed of 5 obtuse concave Petals which are indented, having long narrow Tails; these spread open, and in the Center is situated the roundish Germen, supporting 3 Styles, attended by 10 Stamina which spread asunder. The Germen afterward turns to a roundish pulpy Berry with many Furrows, red when ripe, inclosing 3 or 4 hard angular Seeds. The Fruit of this Sort is eaten by the Inhabitants of the *Isles in America*.

The 3d Sort grows naturally at *Campeachy*, from whence it was sent me. This rises with a strong woody Stalk 18 or 20 Feet high, dividing into many Branches, covered with a brown spotted Bark, and garnished with Spear-shaped Leaves placed opposite, which are hoary on their under Side. The Flowers come out in Umbels from the Side of the Branches, of a Rose Colour, and are succeeded by oval channeled Fruit, like the former.

The 4th Sort grows naturally in *Jamaica*. This rises with a woody Stalk, from 15 to 18 Feet high, dividing into many Branches, which are furrowed and covered with a brown Bark. The Leaves are from 3 to 4 Inches long, and one broad at their Base, where they are rounded in Form of a Heart, lessening gradually to the Point; these are covered on their under Sides with stinging bristly Hairs so closely, as to render it very troublesome to handle them, for these fasten themselves into the Flesh, and are difficult to get out again. The Flowers are produced in Umbels from the Side of the Branches, they are of a light purple Colour, and shaped like those of the other Species; they are succeeded by oval furrowed Fruit, like that of the former Sort. This is called in the *West-Indies, Coubage, or Cowitch Cherry*.

The 5th Sort grows naturally at *Caribagena* in *New Spain*. This rises with a shrubby Stalk about 10 Feet high, covered with a light brown spotted Bark, branching out regularly at the Top on every Side; the Leaves are oval, smooth, and end in acute Points, standing by Pairs opposite, of a light green on their upper Side, but paler on their under. The Flowers come out from the Side of the Stalks, in small Umbels standing erect; the Foot Stalks of the Umbels are scarce an Inch long, and come out alternately from the Side of the Branches. The Flowers are of a pale Blush Colour, and shaped like those of the former Sorts; these are succeeded by roundish furrowed Berries with a red Skin, covering 3 hard angular Seeds.

The 6th Sort grows naturally in *Jamaica*, from whence the late Dr. *Houssoun* sent it to *England*. This rises with several slender shrubby Stalks, from 5 to 6 Feet high, garnished with oblong Heart-shaped Leaves 4 Inches long and 1 Inch and a Quarter broad at the Base, where they are rounded in 2 Heart-shaped Lobes, gradually diminishing to the Point; they are smooth and of a yellowish green, placed by Pairs opposite. The Flowers are produced in loose Panicles from the Side and at the End of the Branches, of a light purple, and shaped like those of the

the other Species, but smaller; the Fruit is more pointed, and less furrowed.

The 7th Sort was sent me from the Island *Barbuda*; this rises with a shrubby Stalk 7 or 8 Feet, covered with a bright purplish Bark spotted and furrowed, dividing toward the Top into several smaller Branches, which are garnished with narrow Spear-shaped Leaves, about 2 Inches long and a Quarter of an Inch broad, of a lucid green on their upper Side, but of a russet brown on their under, where they are closely armed with stinging Bristles, which fasten themselves into the Flesh or Clothes of those who touch them; these Leaves are placed by Pairs opposite. The flowers are produced from the Side and at the End of the Branches in small Umbels; they are a pale purple, of the same Form as the other Species, and are succeeded by small oval furrowed Fruit, of a dark purple when ripe.

The Seeds of the 8th Sort were sent me by Mr. *Richard*, Gardener to the King of *France* at *Trignon*, by the Title of *Bois de Capitain*; these he had just received from the *French* Islands in the *West-Indies*, where the Plants grow naturally. This rises with upright shrubby Stalks 5 or 6 Feet, covered with a dark brown Bark, and dividing into several Branches upward, garnished with oblong oval Leaves ending in acute Points; they are placed by Pairs opposite, and their under Side closely armed with stinging Bristles, which adhering to whatever touches them, renders it very troublesome to handle the Leaves, for if they get into the Flesh it will be difficult to take them out. The Flowers come out from the Wings of the Stalk upon pretty long Foot Stalks, and stand in a Sort of Whorls round the Branches, each sustaining one purplish Flower, of the same Size and Shape with those of the first Sort; these are succeeded by red furrowed Berries, inclosing 3 angular rough Stones.

The 9th Sort was sent me from the Island *Barbuda* where it grows naturally. This rises with a strong woody Stem from 15 to 20 Feet high, dividing into many spreading Branches, covered with a gray Bark, garnished with oblong oval Leaves of a firm Consistence; they are about an Inch long, and half an Inch broad, rounded at their Ends, of a lucid green, and placed by Pairs. The Flowers come out from the Side and at the End of the Branches, upon pretty long Foot Stalks, which are branched in a Sort of Racemus, or long Bunch; they are of the same Form with those of the other Species, but vary in their Colour, some being of a bright red, and others of an Orange Colour in the same Bunch; these are succeeded by small oval Berries, less furrowed than those of the other Species, and, when ripe, change to a dark purple Colour.

The 10th Sort grows in plenty in the Island of *Cuba*. This rises with a shrubby Stalk to the Height of 7 or 8 Feet, sending out Branches the whole Length, covered with a gray Bark, and garnished with narrow prickly Leaves like those of the Holly, which have many stinging Bristles on their under Side. The Flowers are produced in small Clusters from the Side of the Branches, they are of a pale Blush Colour, and shaped like those of the other Species, but smaller; the Fruit is more pointed than those of the common Sort, and turns to a dark purple Colour when ripe.

The 11th Sort grows naturally near the *Havanna*, from whence I received the Seeds. This is a very low Shrub,

feldom rising more than 2 or 3 Feet high; the Stalk is thick and woody, as are also the Branches, which come out on every Side from the Root upward; they are covered with a rough gray Bark, and garnished with lucid green Leaves half an Inch long, and nearly as broad; they appear as if cut at their Ends, where they are hollowed in, and the two Corners rise like Horns ending in a sharp Thorn, as do also the Indentures on the Sides. The Flowers come out from the Side of the Branches, on Foot Stalks an Inch long, each sustaining one small pale Blush Flower, of the same Form with those of the other Species; the Fruit is small, conical, and furrowed, changed to a purple red when ripe.

There are 2 other Species of this Genus, which have been lately introduced from *America*, but as neither of them have yet flowered here, I have not enumerated them; if those warm Parts of *America* were searched by Persons of Skill, there might be many more Species discovered; for from a large Number of imperfect Specimens sent me from the *Spanish West-Indies*, I have selected many which have the Appearance of this Genus, but as they are without Flowers, they cannot be ascertained.

The Fruit of several of the Species here mentioned, are gathered and eaten by the Inhabitants of the Countries where they grow; but the 1st Sort is cultivated in some of the Islands for its Fruit, though that is but indifferent; the Pulp which surrounds the Stones is very thin, but has a pleasant acid Flavour, which renders it agreeable to the Inhabitants of those warm Countries, where, to supply the Want of the Cherries cultivated in *Europe*, they are obliged to eat the Fruit of these Shrubs.

These Plants are preserved in the Gardens of those who are so curious in botanical Studies, as to erect hot Houses for maintaining foreign Plants; and where such Conveniences are, these Plants deserve a Place, because they retain their Leaves all the Year, and commonly continue flowering from *December* to the End of *March*, when they make a fine Appearance at a Season when there is a Scarcity of other Flowers, and many Times they produce ripe Fruit here. Those Sorts whose Leaves are armed with stinging Bristles, like the Cowitch, are the least worthy of a Place in Stoves, being so troublesome to handle, nor do their Flowers make so good an Appearance as many of the other Sorts. The 9th Sort is the most valuable for its Flowers, which are produced in larger Bunches than any of the other, and there being Flowers of different Colours in the same Bunches, they make a fine Variety; this Sort grows more like a Tree than the others, the Leaves are also of a stronger Consistence and of a shining green.

As these are Natives of the warmest Parts of *America*, they will not live through the Winter in *England*, unless preserved in a warm Stove; but when the Plants have obtained Strength, they may be exposed to the open Air in a warm Situation, from the latter End of *June*, till the Beginning of *October*, provided the Weather continues mild; and the Plants so treated, will flower much better than those which are constantly kept in a Stove.

They are all propagated by Seeds, which must be sown on a good hot Bed in Spring; and when the Plants are fit to transplant, they must be each put into a small Pot filled with rich Earth, plunged into a hot Bed of Tanners Bark, and treated in the same Manner as hath been directed for other

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other tender Plants of the same Country; the two first Winters, it will be proper to keep them in the Bark Bed in the Stove; but afterward they may be placed upon Stands in the dry Stove in Winter, where they may be kept in a temperate Warmth, in which they will thrive much better than in a greater Heat; these must be watered 2 or 3 Times a Week, when they are placed in the dry Stove, but it must not be given in large Quantities.

MALT-DUST is accounted a great Enricher of barren Ground; it contains in it a natural Heat and Sweetness, which gives the Earth whereon it is laid a proper Fermentation, as those who live in malting Countries have found by Experience.

Some are of Opinion, that there is not a greater Sweetener than Malt Dust, where the Grounds are natural Clay, and have contracted a Sourness and Austerity, whether by Reason of its having lain long untilld and unexposed to the Air, or by Reason of Water having stood long thereon.

MALVA. Tourn. Inst. R. H. 94. Tab. 23. Lin. Gen. Plant. 751. Mallows; in French, Mauve.

The Characters are,

The Flower has a double Empalement; the outer is composed of 3 Spear-shaped Leaves, and is permanent; the inner is of one Leaf, cut into 5 broad Segments at the Brim. The Flower is, according to Tournefort, Ray, &c. of one Petal; but according to Linnæus, it has 5; they are joined at the Base, and spread open. It has a great Number of Stamina which coalesce at Bottom in a Cylinder, but spread open above, and are inserted in the Petal, terminated by Kidney-shaped Summits. In the Center is situated an orbicular Germen supporting a short cylindrical Style, with many bristly Stigmas, the Length of the Style. The Empalement turns to several Capsules, which are joined in an orbicular depressed Head fastened to the Column, opening on their Inside, each containing one Kidney-shaped Seed.

The Species are,

1. MALVA caule erecto herbaceo, foliis lobatis obtusis, pedunculis petiolisque pilosis. Lin. Sp. Plant. 689. Mallow with an erect herbaceous Stalk, obtuse Lobes to the Leaves, and hairy Foot Stalks both to the Leaves and Flowers. This is the *Malva sylvestris*, folio sinuato. C. B. P. 314. Wild Mallow with a sinuated Leaf.

2. MALVA caule repente, foliis cordato-orbiculatis obsolete quinquelobatis. Hort. Cliff. 347. Mallow with a creeping Stalk, and round Heart-shaped Leaves, having five indentures like Lobes. This is the *Malva vulgaris*, flore minora, folio rotundo. J. B. 2. p. 949. Common Mallow with a small Flower and a round Leaf.

3. MALVA annua, caule erecto herbaceo simplici, foliis lobatis obtusis crenatis. Annual Mallow with an erect, herbaceous, single Stalk, and obtuse lobed Leaves which are crenated. This is the *Malva Orientalis erectior*, flore magno suavè rubente. Tourn. Eastern Mallow with a more upright Stalk, and a large, soft, red Flower.

4. MALVA caule erecto, foliis angulatis, floribus axillaribus glomeratis. Ver. Cliff. 356. Mallow with an erect Stalk, angular Leaves and Flowers growing in Clusters at the Wings of the Stalks. This is the *Malva foliis crispis*. C. B. P. 315. Curled or furbelowed Mallow.

5. MALVA annua, caule erecto herbaceo simplici, foliis suborbiculatis obsolete quinquelobatis, floribus confertis alaribus sessilibus. Annual Mallow with an erect herbaceous single Stalk, Leaves almost round, with five indented

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Lobes, and Flowers growing in Clusters, which sit close to the Stalks. This is the *Malva Sinensis erecta, flosculis albis minimis*. Boerb. Ind. alt. Upright annual China Mallow, with very small white Flowers.

6. MALVA caule erecto ramoso hirsuto, foliis angulatis, floribus alaribus pedunculis brevioribus. Mallow with an erect, branching, hairy Stalk, angular Leaves, and Flowers proceeding from the Wings of the Stalks, which grow upon shorter Foot Stalks. This is the *Malva Cretica annua altissima, flore parvo ad alas umbellato*. Tourn. Cor. 2. Tallest annual Mallow of Crete, with small Flowers growing in Umbels on the Sides of the Stalk.

7. MALVA caule erecto herbaceo, foliis lobatis, spicis secundis axillaribus. Lin. Sp. Plant. 688. Mallow with an erect herbaceous Stalk; Leaves having Lobes, and Spikes of Flowers looking all one Way, proceeding from the Sides of the Stalks.

8. MALVA caule erecto, foliis multipartitis scabriusculis. Hort. Cliff. 347. Mallow with an erect Stalk, and rough Leaves divided into many Parts. *Alcea tenuifolia crispa*. J. B. Narrow leaved curled Vervain Mallow.

9. MALVA caule erecto, foliis trilobatis obtusis dentatis glabris. Mallow with an erect Stalk, Leaves with three obtuse Lobes which are smooth and indented. *Alcea vulgaris major*. C. B. P. Common greater Vervain Mallow.

10. MALVA caule erecto hirsuto, foliis trilobatis dentatis subtus tomentosis. Mallow with an erect hairy Stalk, and indented Leaves having three Lobes, which are downy on their under Side.

11. MALVA foliis radicalibus reniformibus incis, caulibus quinque partitis pinnato-multifidis. Hort. Upsal. 202. Mallow with Kidney-shaped lower Leaves which are cut, and those on the Stalks divided into five Parts, and ending in winged Points. *Alcea folia rotundo laciniato*. C. B. P. Round cut leaved Vervain Mallow.

12. MALVA foliis palmatis dentatis, corollis calyce minoribus. Lin. Sp. Plant. 690. Mallow with Hand-shaped indented Leaves, and Petals less than the Empalement. This is the *Alcea Aegyptia; Geranii folio*. Juss. Egyptian Vervain Mallow with a Crane's-bill Leaf.

13. MALVA foliis quinquelobatis incis, calycibus acutis hispids, pedunculis longissimis. Mallow with cut Leaves having five Lobes, acute prickly Empalements, and very long Foot Stalks. This is the *Alcea maritima Galaprovencialis, Geranii folio*. Tourn. Inst. Maritime Vervain Mallow of Provence, with a Crane's-bill Leaf.

14. MALVA foliis subcordatis laciniatis hirsutis, caule arborescente. Mallow with hairy cut Leaves almost Heart-shaped, and a Tree-like Stalk. This is the *Malva Africana frutescens, flore rubro*. Hort. Amst. 2. p. 171. African shrubby Mallow with a red Flower.

15. MALVA foliis cordatis crenatis, floribus lateralibus solitariis, terminalibus spicatis. Prod. Leyd. 359. Mallow with Heart-shaped crenated Leaves, and Flowers growing singly from the Sides of the Stalks, and in Spikes at the Top. This is the *Althæa Americana, pumila, flore luteo spicato*. Breyn. Cent. 124. Low American Marsh-mallow with a yellow spiked Flower.

The two first Sorts are found wild in most Parts of England, so are rarely cultivated in Gardens. The first is the Sort commonly used in Medicine, with which the Markets are supplied by the Herb Folks, who gather it in the Fields. These are so well known, as to need no Description.

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There is a Variety of the first with white Flowers, which continues the same from Seeds; but as it only differs in the Colour of the Flower, so it cannot be reckoned a distinct Species.

The 3d Sort was discovered by Dr. Tournefort in the *Levant*; this is an annual Plant with an erect Stalk, the Flowers are larger than those of the common Sort, and are of a soft red Colour: This is preserved in some curious Gardens for the sake of Variety.

The 4th Sort is annual; this rises with an upright Stalk 4 or 5 Feet high, the Leaves are curled on their Edges, for which Variety it is preserved in Gardens.

The 5th Sort was formerly sent from *China* as a Pot-herb, and hath been cultivated in some curious Gardens in *England*; though it is not likely to obtain here as an esculent Plant; since we have many others which are preferable to it for that Purpose. This is an annual Plant, which will propagate itself fast enough, provided it be permitted to scatter its Seeds, when they seldom fail to grow, and are often very troublesome when they have gotten Possession of the Ground.

The 6th Sort was discovered by Dr. Tournefort, in the Island of *Candia*, from whence he sent the Seeds. This is preserved in Botanical Gardens, but will become a Weed, if suffered to scatter the Seeds.

The 7th Sort grows naturally in *Peru*, from whence the Seeds were sent to the Royal Garden at *Paris*, by Mr. Joseph de Jussieu. This is an annual Plant, rising with an upright branching Stalk near 2 Feet high, garnished with broad hairy Leaves having 3 Lobes. The Flowers grow in Spikes from the Wings of the Stalks, they are small, of a pale blue, and set very closely on the Spikes. These appear in *June*, and are succeeded by Seeds, which, if permitted to scatter, will rise plentifully the following Spring without Care.

The 8th Sort is a biennial Plant, which grows naturally in Pastures in many Parts of *England*, so is seldom admitted into Gardens. The Stalks of this are a Foot and a Half long, and frequently incline toward the Ground. The Leaves are finely cut into narrow Segments almost to the Mid rib, and these Segments are deeply indented. The Flowers grow at the Top of the Stalks, they are shaped like those of the common Mallow, and are of a Rose Colour. It flowers in *June*, and the Seeds ripen in Autumn.

The 9th Sort is the common Vervain Mallow, which is mentioned in the Catalogue of medicinal Plants. This is found growing naturally in some of the midland Counties in *England*, but not near *London*. It is a biennial Plant, the Stalks rise higher than those of the former; the Leaves are cut into 3 obtuse Lobes which are indented. The Flowers are larger than those of the former, but appear at the same Time, and the Seeds ripen in Autumn.

The 10th Sort differs from the 9th, in having hairy Stalks, and the under Side of the Leaves being downy. This grows naturally about *Paris*.

The 11th Sort is a biennial Plant, which grows naturally in *France* and *Italy*. The lower Leaves are rounded and eared somewhat like a Kidney in Shape, and are cut on their Edges; but those on the Stalks are divided into 5 Parts, which end with many Wing-shaped Points; the Stalks are shorter than those of the other Sorts.

The 12th Sort was sent from *Egypt* to the Royal Garden at *Paris*, and hath since been communicated to many

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other Gardens. This is an annual Plant, whose Stalks are about a Foot long; they are smooth, and decline toward the Ground. The Leaves stand upon pretty long Foot Stalks, they are shaped like a Hand, having 5 Divisions which join at their Base to the Foot Stalk, these are indented on their Sides and Tops. The Flowers come out single from the Wings of the Stalk, and at the Top in Clusters, having pretty large acute Empalements; they are small, of a pale blue Colour, and appear in *June*; the Seeds ripen in Autumn.

The 13th Sort grows naturally in the South of *France*; this is an annual Plant, which has some Resemblance of the former, but the Stalks are longer and more branched; the Leaves are cut into 5 obtuse Lobes almost to the Bottom, and these are deeply cut on their Side. The Flowers stand upon very long Foot Stalks, the Empalement is large, prickly, and acute-pointed; the Flowers are blue, and larger than the other Sort. It flowers and ripens Seeds about the same Time.

The 14th Sort grows naturally at the *Cape of Good Hope*; this rises with a woody Stalk 10 or 12 Feet high, sending out Branches from the Side the whole Length; the Stalks and Branches are closely covered with Hairs, and garnished with hairy Leaves, indented on the Sides, so as to have the Appearance of a trilobate Leaf; these on the young Plants are 3 Inches long and 2 broad at their Base, but as the Plants grow older, they are scarce half that Size. The Flowers come out from the Side of the Branches, on Foot Stalks an Inch long; they are a deep red, and shaped like those of the common Mallow, but smaller. This Plant continues flowering great Part of the Year, which renders it valuable.

There are 2 other Varieties of this Plant, which have been mentioned by some Authors as distinct Species. The 1st is, *Alcea Africana frutescens, grossularia folio ampliore, unguibus florum atro-rubentibus. Act. Phil. 1729.* Shrubby African Vervain Mallow, with a larger Gooseberry Leaf, and the Bottoms of the Flower of a dark red. The other is, *Alcea Africana frutescens, folio grossularia flore parvo rubro. Boerb. Ind.* Shrubby African Vervain Mallow, with a Gooseberry Leaf, and a small red Flower. The Leaves of the last appear very different from either of the other, being deeply divided into 3 Lobes, which are also deeply indented, so that any Person upon seeing it would suppose it a different Species; but I have frequently raised all these, with other intermediate Varieties from the Seeds of one Plant.

This Plant is easily propagated by Seeds, which, if sown on a common Border in Spring, the Plants will come up; but as it is too tender to live abroad in Winter, so when the Plants are 3 or 4 Inches high, they should be planted each in a Pot of light fresh Earth, placing them in the Shade till they have taken fresh Root; then they may be removed to a sheltered Situation, intermixing them with other hardy exotics, where they may remain till the Frost comes on, when they should be removed into the Green-house, and afterward treated as the hardy Plants from the same Country, allowing them Plenty of free Air in mild Weather.

The 15th Sort grows naturally in most of the Islands in the *West-Indies*; this is an annual Plant, which rises about a Foot high, sending out a few short Branches from the Side; these are woolly, and are garnished with Heart-shaped

shaped woolly Leaves, notched on their Edges; these stand alternately on pretty long Foot Stalks. The Flowers are produced singly from the Side of the Stalk, and in a close Spike at the Top; they are small, of a pale yellow, and appear in July; the Seeds ripen in Autumn.

This is propagated by Seeds, which must be sown upon a hot Bed in Spring; when the Plants are fit to remove, they should be each planted in a small Pot filled with light fresh Earth, and plunged into a new hot Bed, shading them until they have taken fresh Root; then they must have free Air admitted to them in Proportion to the Warmth of the Season, and the latter End of June they may be placed in the open Air in a sheltered Situation, where they will flower and produce ripe Seeds.

The Seeds of these Plants should be sown in March, on a Bed of fresh light Earth; when they are 4 Inches high, they should be transplanted where they are designed to remain, allowing them a large Distance; for if they are planted too close, they do not appear so well; they are best when intermixed with other Flowers of the same Growth, where they afford an agreeable Variety.

These Seeds may also be sown in August, and the Plants will endure the greatest Cold of our Climate, if placed on a dry Soil, and grow larger, and flower sooner, than those sown in the Spring; or if the Seeds are permitted to scatter, they will come up as the former Sorts, and thrive equally well. There are several other Sorts of Mallows, some of which are Natives of this Country; but as they are Plants of no great Beauty or Use, it is needless to mention them in this Place.

MALVA ARBOREA. See Lavatera.

MALVA ROSEA. See Alcea.

MALUS, the Apple Tree.

The Characters are,

The Tree grows very large; the Branches spread, and are more depressed than those of the Pear Tree. The Flower consists of five Leaves, which expand in Form of a Rose. The Fruit is hollowed about the Foot Stalk, is, for the most Part, roundish, and umbilicated at the Top; is fleshy and divided into five Cells or Partitions, in each of which is lodged one oblong Seed.

The Species are,

1. *MALUS foliis ovatis serratis, caule arboreo.* Apple with oval sawed Leaves, and a Tree-like Stalk. This is the *Malus sylvestris, fructu valde acerbo.* Tourn. Inst. Wild Apple or Crab, with a very four Fruit.

2. *MALUS foliis serrato-angulosis.* Apple with angular sawed Leaves. This is the *Malus sylvestris Virginiana, floribus odoratis.* Cat. Hort. Wild Crab of Virginia, with a sweet scented Flower.

3. *MALUS foliis ovatis serratis, caule fruticoso.* Apple with oval sawed Leaves and a shrubby Stalk. This is the *Malus pumila quæ potius frutex quam arbor.* C. B. P. 433. Dwarf Apple, which is rather a Shrub than a Tree, commonly called Paradise Apple.

Of the 1st Sort there are 2 Varieties of Fruit, one is white, and the other purple toward the Sun, but these are accidental Variations. There is also a Variety of this with variegated Leaves, which has been propagated in some of the Nurseries near London; but when the Trees grow vigorous, their Leaves become plain.

The 2d Sort grows naturally in most Parts of North America, where the Inhabitants plant them for Stocks to graft other Sorts of Apples upon; the Leaves of this are

longer and narrower than any of the other Sorts, and are cut into acute Angles on their Sides. The Flowers of this have a fragrant Odour, which perfumes the American Woods at the Time they appear.

The 3d Sort is undoubtedly a distinct Species from all the others, for it never rises to any Height; the Branches are weak, scarce able to support themselves, and this Difference is constant when raised from Seeds.

I have not distinguished the Apples from the Crab, as distinct Species, though I have never seen any of the Apples produced from the Seeds of Crabs. I shall next mention a few of those Sorts of Apples, which have been introduced from France; they were most of them grafted on Paradise Stocks, and for some Time much esteemed; I shall mention those of our own Growth afterward.

There is a Sort of Apple called the Fig Apple, which is common to England and North America, but the Fruit is not greatly esteemed; however, as some Persons are fond of Variety, so I have mentioned it.

Pomme de Rambour. The Rambour is a very large Fruit, of a fine red next the Sun, and striped with a pale or yellowish green. This ripens very early, commonly about the End of August, and soon grows mealy, therefore is not esteemed in England.

Pomme de Courpendu, the hanging Body. This is a very large Apple, of an oblong Figure, having some irregular Rifings or Angles, which run from the Base to the Crown; it is of a red Cast on the Side toward the Sun, but pale on the other Side; the Foot Stalk is long and slender, so that the Fruit is always hanging downward, which occasioned the French Gardeners to give it this Name.

Rennette-blanche, the White Renette, or French Renette. This is a large fine Fruit of a roundish Figure, and of a pale green, changing a little yellowish when ripe, having some small gray Spots; the Juice is sugary, and it is good for Eating or Baking; it will keep till after Christmas sound.

Renette-grise. This is a middle sized Fruit, shaped like the Golden Renette; of a deep gray Colour on the Side next the Sun, but on the other Side intermixed with yellow; it is a very juicy good Apple, of a quick Flavour. It ripens in October, and will not keep long.

Pomme d'Api. This is a small hard Fruit, of a bright purple Colour on the Side next the Sun, and of a yellowish green on the other Side; it is a very firm Fruit, but hath not much Flavour, so is only preserved by some Persons by Way of Curiosity. It keeps a long Time sound, and makes a Variety in a Dish of Fruit.

Le Calville d'Automne, the Autumn Calville. This is a large Fruit of an oblong Figure, of a fine red Colour toward the Sun. The Juice is vinous, and much esteemed by the French.

Fenouillet ou Pomme d'Anis, the Fennel, or Anise Apple. This is a middle sized Fruit, a little longer than a Golden Pippin, of a grayish Colour. The Pulp is tender, and has a spicy Taste like Anise-feed; the Wood and the Leaves are whitish.

Pomme violette, the Violet Apple. This is a pretty large Fruit, of a pale green, striped with deep red to the Sun. The Juice is sugary, and has a Flavour of Violets, which occasioned the Name.

The Crab, which is the 1st Sort here mentioned, has been generally esteemed as the best Stock for grafting Apples upon, being very hardy, and of long Duration; but

but of late Years there have been few Persons who have been curious enough to raise these Stocks, having commonly sown the Kernels of all Sorts of Cyder Apples for Stocks without Distinction; as these are much easier to procure than the other: Gardeners generally call all those Crabs, which are produced from the Kernel, and have not been grafted; but were the Kernels of Crabs sown, I should prefer them for Stocks, because they are never so luxuriant in Growth, as those from Apple Kernels, and continue longer sound; beside, Crab-stocks will preserve some of the best Sorts of Apples in their true Size, Colour, and Flavour; whereas the other free Stocks produce larger Fruit, which are not so well tasted, nor will they keep so long.

The Paradise Apple hath, of late Years, greatly obtained for Stocks to graft or bud upon, but these are not of long Duration; nor will the Trees grafted upon them ever grow to any Size, unless they are planted so low as that the Cyon may strike Root into the Ground, when it will be equal to no Stock, for the Graft will draw its Nourishment from the Ground, so that it is only by Way of Curiosity, or for very small Gardens, that these Stocks are proper, since there can never be expected any considerable Quantity of Fruit from such Trees.

These Trees have been much more esteemed in France, where they were frequently brought to the Table in the Pots growing with their Fruit upon them; but this being only a Curiosity, it never obtained much in England, so that the Gardeners do not propagate many of them here at present.

There is another Apple which is called the *Dutch Paradise Apple*, much cultivated in the Nurseries for grafting Apples upon, in order to have them Dwarfs; and these will not decay or canker as the other, nor do they stint the Grafts near so much, so are generally preferred for planting Espaliers or Dwarfs, being easily kept within the Compass usually allotted to these Trees.

Some Persons have also made Use of Codlin Stocks to graft Apples upon, in order to make them Dwarf; but the Fruit which are upon these Stocks are not so firm, nor do they last so long, therefore the Winter Fruits should never be grafted upon these.

The *Virginian Crab Tree* with sweet Flowers, is preserved by such Persons as are curious in collecting great Variety of Trees; it may be propagated by budding or grafting it upon the common Crab or Apple Tree; but it is somewhat tender while young, wherefore it should be planted in a warm Situation, otherwise it will be subject to suffer by an extreme hard Winter. The Flowers of this Tree are said to be exceeding sweet in *Virginia*, where it grows in the Woods in great Plenty; but I could not observe much Scent in some of them which have flowered in *England*, so that I am in doubt whether the Sort at present in the Gardens, is the very same with that of *Virginia*, or perhaps it may have degenerated by sowing the Seeds, which is the Way it was first obtained in *England*.

The Fig Apple is supposed by many Persons, to be produced without a previous Flower. This Opinion is rejected by some curious Observers, who affirm, there is a small Flower precedes the Fruit, which seldom continues above a Day or two. Which of these Opinions is the right, I have not as yet, had an Opportunity to determine, not having a Tree in my own Possession which is

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arrived at Maturity to produce Fruit; though it might reasonably be expected, that such who have had Trees of this Kind several Years, might have determined this Point long before this Time.

I remember an Account of a Tree of this Kind, mentioned in a Letter from *New England*, written by *Paul Dudley, Esq;* to the *Royal Society*, and published in the *Philosophical Transactions*, N^o 385, which was exceeding large, and produced great Quantities of Fruit, without any previous Flowers; but it grew at some Distance from his Habitation, and he having no other Opportunity to observe it strictly himself, but by visiting the Place 2 or 3 Times about the Season of flowering, and not being apprized of the sudden Decay of the Flowers, they might have appeared and dropt off, between the Times of his visiting the Place.

The other Sorts above-mentioned, have been introduced from *France*, but there are not above two or three of them, which are much esteemed in *England*, viz. the *French Renette*, the *Renette-grise*, and the *Violet Apple*; the others being early Fruit, which do not keep long, and their Flesh is generally mealy, so that they do not deserve to be propagated, as we have many better Fruits in *England*: But as some Persons may be willing to have all the Sorts, I have therefore mentioned them: I shall next put down those Sorts of Apples, which are best esteemed in *England*, placing them in Order according to their Time of ripening.

The first Apple which is brought to the Markets, is the *Codlin*. This Fruit is so well known in *England*, that it is needless to describe it.

The next is the *Margaret Apple*: This Fruit is not so long as the *Codlin*, of a middling Size; the Side next the Sun changes to a faint red, when ripe; the other Side is of a pale green; the Fruit is firm, of a quick pleasant Taste, but doth not keep long.

The *Summer Pearmain* is an oblong Fruit, striped with red next the Sun; the Flesh is soft, and in a short Time is mealy, so that it is not greatly esteemed.

The *Kentish Fill Basket* is a Species of *Codlin*, of a large Size, and somewhat longer shaped than the *Codlin*; this ripens a little later in the Season, and is generally used for baking, &c.

The transparent Apple was brought to *England* a few Years since, and esteemed a Curiosity; it came from *Petersburgh*, where it is affirmed to be so transparent, that the Kernels may be perfectly seen when the Apple is held to the Light, but, in this Country, it is a mealy insipid Fruit, so not worth propagating.

Loan's Pearmain: This is a beautiful Fruit of a middling Size; the Side next the Sun is a beautiful red, striped with the same Colour on the other; the Flesh is vinous, but soon grows mealy.

The *Quince Apple*: This is a small Fruit, seldom larger than the *Golden Pippin*, but is in Shape like the *Quince*, especially toward the Stalk; the Side next the Sun is of a Russet Colour, on the other Side inclining to yellow; this is an excellent Apple for about three Weeks, in *September*, but it will not keep much longer.

The *Golden Renette* is a Fruit so well known in *England*, as to need no Description; this ripens about *Michaelmas*, and for about a Month is a very good Fruit, either for eating raw, or baking.

The *Aromatick Pippin* is also a very good Apple: It is about the Size of a *Nonpareil*, but a little longer; the

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the Side next the Sun is of a bright Russet Colour; the Flesh is breaking, and hath an aromack Flavours. It ripens in *October*.

The *Hertfordshire* Pearmain, by some called the Winter Pearmain, is a good sized Fruit, rather long than round, of a fine red next the Sun, and striped with the same Colour on the other Side; the Flesh is juicy, and stews well, but is not esteemed for eating by nice Palates. This is fit for Use in *November* and *December*.

The *Kentish* Pippin is a large handsome Fruit, of an oblong Figure; and the Skin is of a pale green Colour; the Flesh is breaking, full of Juice, and of a quick acid Flavour. This is a very good Kitchen Fruit, and will keep till *February*.

The *Holland* Pippin is larger than the former; the Fruit is somewhat longer, the Skin of a darker green, and the Flesh firm and juicy. This is a very good Kitchen Fruit, and will keep late in the Season.

The Monstrous Renette is a very large Apple, of an oblong Shape, turning red toward the Sun, but of a dark green on the other Side; the Flesh is apt to be mealy, so is not much valued by the curious, and only preserved for the Magnitude of the Fruit.

The Embroidered Apple is a pretty large Fruit, somewhat shaped like the Pearmain, but the Stripes of red are very broad, from whence the Gardeners have given it this Title; it is a middling Fruit, and is commonly used as a Kitchen Apple, though there are many better.

The Royal Russet, by some called the Leather Coat Russet, on Account of the deep Russet Colour of the Skin; this is a large fair Fruit, of an oblong Figure, broad toward the Base; the Flesh is inclinable to yellow. This is one of the best Kitchen Apples we have, and a very great Bearer; the Trees grow large and handsome, and the Fruit is in Use from *October* till *April*; it is also a pleasant Fruit to eat.

Wheeler's Russet is an Apple of a middling Size, flat, and round; the Stalk is slender, the Side next the Sun of a light Russet Colour, the other Side inclining to a pale yellow, when ripe; the Flesh is firm, and the Juice has a very quick acid Flavour, but it is an excellent Kitchen Fruit, and will keep a long Time.

Pile's Russet is not quite so large as the former, but is of an oval Figure, of a Russet Colour to the Sun, and of a dark green on the other Side; it is a very firm Fruit, of a sharp acid Flavour, but is much esteemed for baking, and will keep sound till *April*, or later, if they are well preserved.

The Nonpareil is a Fruit well known in *England*, though there is another Apple which is frequently sold in the Markets for it, which is what the *French* call *Haute-bonne*; this is a larger fairer Fruit than the Nonpareil, more inclining to yellow; the Russet Colour brighter, and it is earlier ripe, and sooner gone; this is not so flat as the true Nonpareil, nor is the Juice so sharp, though it is a good Apple, in its Season; but the Nonpareil is seldom ripe before *Christmas*, and where they are well preserved they will keep till *May* perfectly sound; this is justly esteemed one of the best Apples yet known.

The Golden Pippin is a Fruit peculiar to *England*; there are few Countries Abroad, where this succeeds well, nor do they produce so good Fruit in many Parts of *England*, as were to be wished; this is in some Measure owing to their being grafted on free Stocks, which

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enlarges the Fruit, but renders it less valuable, because the Flesh is not so firm, nor the Flavour so quick, and it is apt to be dry and mealy; therefore this should always be grafted upon the Crab Stock, which will not canker like the others, and though the Fruit will not be so fair to the Sight, yet it will be better flavoured.

There are yet a great Variety of Apples, which, being inferior to those here mentioned, I have omitted, as those which are here enumerated will be sufficient to furnish the Table and the Kitchen, during the whole Season of these Fruits, so that where these Sorts are to be had, no Person of Taste will eat the other.

I shall here mention some of the Apples which are chiefly preferred for making Cyder, though there are, in every Cyder Country, new Sorts frequently obtained from the Kernels; but those hereafter mentioned, have, for some Years, been in the greatest Esteem.

The Red-streak.

Devonshire Royal Wilding.

The Whitfour.

Hertfordshire Under Leaf.

John Apple, or *Deux-annes*.

Everlasting Hanger.

Gennet Moyle.

All the Sorts of Apples are propagated by Grafting or Budding, upon the Stocks of the same Kind, for they will not take upon any other Sort of Fruit Tree. In the Nurseries there are 3 Sorts of Stocks generally used, to graft Apples upon; the first are called Free Stocks; these are raised from the Kernels of all Sorts of Apples, indifferently, and these are also termed Crab Stocks; for all those Trees which are produced from the Seeds, before they are grafted, are termed Crabs without any Distinction; but, as I before observed, I should always prefer such Stocks as are raised from the Kernels of Crabs, where they are pressed for Verjuice; and I find several of the old writers on this Subject of the same Mind. Mr. *Austen*, who wrote a hundred Years ago, says, *The Stock which he accounts best for Apple Grafts, is the Crab, which is better than sweeter Apple Trees to graft on, because they are usually free from Canker, and will become very large Trees, and, I conceive, will last longer than Stocks of sweeter Apples, and will make Fruits more strong and hardy to endure Frosts*; and it is very certain, that by frequently grafting some Sorts of Apples upon Free Stocks, the Fruits have been rendered less firm and poignant, and of shorter Duration.

The 2d. Sort of Stock is the *Dutch* Creeper; these are designed to stint the Growth of the Trees, and keep them within Compass for Dwarfs, or Espaliers.

The 3d. Sort is the Paradise Apple, a very low Shrub, so only proper for Trees kept in Pots, by Way of Curiosity, for these do not continue long.

Some have made use of Codlin Stocks for grafting Apples, in order to stint their Growth; but as these are commonly propagated by Suckers, I would by no Means advise the use of them, nor would I choose to raise the Codlin Trees from Suckers, but rather graft them upon Crab Stocks, which will cause the Fruit to be firmer, last longer, and have a sharper Flavour; and these Trees will last much longer sound, and never put out Suckers, as the Codlins always do, which, if not constantly taken off, will weaken the Trees, and cause them to canker, and it is not only from the Roots, but from the Knots of their Stems, there

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there are generally a great Number of strong Shoots produced, which fill the Trees with useless Shoots, and render them unsightly, and the Fruit small and crumpled.

The Method of raising Stocks from the Kernels of Crabs, or Apples, is, to procure them where they are pressed for Verjuice or Cyder, and after they are cleared of the Pulp, they may be sown upon a Bed of light Earth, covering them over about half an Inch thick with the same light Earth; these may be sown in November or December, where the Ground is dry, but in wet Ground, it will be better to defer it till February; but then the Seeds should be preserved in dry Sand, and kept out of the Reach of Vermin, for if Mice or Rats can get to them, they will devour the Seeds; there should also be Care taken of the Seeds, when they are sown, to protect them from these Vermin, by setting Traps to take them, &c. In Spring, when the Plants begin to appear, they must be carefully weeded, and if the Season should prove dry, it will be of great Service to water them 2 or 3 Times a Week; and, during the Summer, they must be constantly kept clear from Weeds, which, if suffered to grow, will soon overtop the Plants, and spoil their Growth; if these thrive well, they will be fit to transplant into the Nursery the October following, at which Time the Ground should be carefully digged, and cleansed from the Roots of all bad Weeds; then the Stocks should be planted in Rows 3 Feet asunder, and the Plants one Foot Distance in the Rows, closing the Earth pretty fast to their Roots; when the Stocks are transplanted out of the Seed Bed, the first Autumn after sowing, they need not be headed, but where they are inclined to shoot downward, the Tap Root must be shortened, in order to force out horizontal Roots; if the Ground is pretty good in which these Stocks are planted, and the Weeds constantly cleared away, the Stocks will make great Progress, so that those which are intended for Dwarfs, may be grafted the Spring Twelve Months after they are planted out of the Seed Bed; but those which are designed for Standards will require 2 Years more Growth, before they will be fit to graft, by which Time they will be upward of 6 Feet high. The other necessary Work to be observed in the Culture of these Trees, while they remain in the Nursery, being exhibited under the Article of *Nursery*, I shall not repeat in this Place.

I shall next treat of the Manner of planting such of these Trees, as are designed for Espaliers in the Kitchen

Largest growing Trees.

All the Sorts of Pearmains.
Kentish Pippin.
Holland Pippin.
Monstrous Renette.
Royal Russet.
Wheeler's Russet.
Pile's Russet.
Nonpareil.
Violet Apple.

Middle growing Trees.

Margaret Apple.
Golden Renette.
Aromatick Pippin.
Embroidered Apple.
Renette Grise.
White Renette.
Codlin.

Garden, where, if there is an Extent of Ground, it will be proper to plant, not only such Sorts as are for the Use of the Table, but also a Quantity of Trees to supply the Kitchen; but where the Kitchen Garden is small, the latter must be supplied from Standard Trees, in the Orchard, or where-ever they are planted: As many of these Kitchen Apples are large, and hang late in Autumn upon the Trees, they will be much more exposed to the strong Winds, on Standard Trees, than in Espaliers, whereby many of the Fruit will be blown down before they are ripe, and others bruised, so as to prevent their keeping; therefore where it can be done, I should always prefer planting them in Espaliers.

The Distance which I should choose to allow these Trees, should not be less than 25, or 30 Feet, for such Sorts as are of moderate Growth (if upon Crab or Free Stocks;) but the larger growing Sorts should not be allowed less Room than 35 Feet, which will be found full near enough, if the Ground is good, and the Trees properly trained; for as the Branches of these Trees should not be shortened, but trained at their full Length, so in a few Years they will be found to meet. Indeed, at the first planting, the Distance will appear so great, to those who have not observed the vigorous Growth of these Trees, that they will suppose they never can extend their Branches so far, as to cover the Espalier; but if these Persons will but observe the Growth of Standard Trees of the same Kinds, and see how wide their Branches are extended on every Side, they may be soon convinced, that as these Espalier Trees are allowed to spread but on two Sides, they will of Course make more Progress, as the whole Nourishment of the Root will be employed in these Side Branches, than where there is a greater Number of Branches on every Side of the Tree, which are to be supplied with the same Nourishment.

The next Thing to be observed, is to make Choice of such Sorts of Fruits as grow nearly alike, to plant in the same Espalier. This is of great Consequence, because of the Distance they are to be placed, otherwise those Sorts which make the largest Shoots, would have less Room to spread than those of smaller Growth; beside, when all the Trees in one Espalier are nearly equal in Growth, they will have a better Appearance than when some are tall, and others short; but for the better Instruction of those who are not conversant in these Things, I shall divide the Sorts of Apples into three Classes according to their different Growths.

Smallest growing Trees.

Quince Apple.
Transparent Apple.
Golden Pippin.
Pomme d'api.
Fenouillet, or Anis Apple.

N. B. These are all supposed to be grafted on the same Sort of Stocks.

If these Apples are grafted upon Crab Stocks, I would willingly place them at the following Distance from each other, especially where the Soil is good, viz. the largest growing Trees at 40 Feet, the middle growing at 30

Feet, and the small growing at 20 Feet, which, from constant Experience, I find to be full near enough; for in many Places, where I have planted these Trees at 24 Feet Distance, the Trees have shot so, that in seven

Years their Branches have met; and in some Places where every other Tree hath been taken up, the Branches have almost joined in seven Years after; therefore it will be much the better Way to plant these Trees at a proper Distance at first, and between these to plant Dwarf Cherries, Currants, or other Sorts of Fruit, to bear for a few Years, which may be cut away when the Apple Trees have extended their Branches to them; for when the Apple Trees are planted nearer together, few Persons care to cut down the Trees, when they are fruitful, so that they are obliged to use the Knife, Saw, and Chisel, more than is proper for the future Good of the Trees, and many Times, where Persons are inclinable to take away Part of their Trees, the Distances will be often so irregular (where there was not this Consideration in Planting,) as to render the Espalier unsightly.

When the Trees are upon the *Dutch Dwarf Stock*, the Distance should be for the larger growing Trees 25 Feet, for those of middle Growth 18, and the smallest 12 Feet, which will be found full near, where the Trees thrive well.

The next is the Choice of the Trees, which should not be more than 2 Years Growth from the Graft, but those of one Year should be preferred; be careful that their Stocks are young, sound, and smooth, free from Canker, and which have not been cut down in the Nursery; when they are taken up, all the small Fibres should be entirely cut off from their Roots, which, if left on, will turn mouldy, and decay, so will obstruct the new Fibres in their Growth; the extreme Parts of the Roots must be shortened, and all bruised Roots cut off; and if there are any misplaced Roots, which cross each other, they should also be cut away. As to Pruning the Head of these Trees, there need be nothing more done, than to cut off any Branches, which are so situated, that they cannot be trained to the Line of the Espalier; in the Planting, care must be taken not to place their Roots too deep in the Ground, especially if the Soil is moist, but rather raise them on a little Hill, which will be necessary to allow for the raising of the Borders afterward. The best Season for planting these Trees (in all Soils which are not very moist) is, from *October*, to the Middle, or latter End of *November*, according as the Season continues mild; but so soon as the Leaves fall, they may be removed with great Safety. After the Trees are planted, it will be proper to place down a Stake to each Tree, to which the Branches should be fastened, to prevent the Winds from shaking or loosening their Roots, which will destroy the young Fibres; for when these Trees are planted early in Autumn, they will very soon push out a great Number of new Fibres, which, being very tender, are soon broken, and the Trees greatly injured thereby. If the Winter should prove severe, it will be proper to lay some rotten Dung, Tanners Bark, or some Sort of Mulch, about their Roots, to prevent the Frost from penetrating the Ground, which might damage these tender Fibres; but I would not advise the laying this Mulch before the Frost begins, for if it is laid over the Roots, soon after the Trees are planted (as is often practised), it will prevent the Moisture entering the Ground, and do much Harm to the Trees.

The following Spring, before they begin to push, there should be 2 or 3 short Stakes put down on each Side of the Tree, to which the Branches should be fastened

down as horizontally as possible, never cutting them down, as is by some practised, for there will be no Danger of their putting out Branches enough to furnish the Espalier, if the Trees are once well established in their new Quarters.

In Pruning these Trees, the chief Point is, never to shorten any of the Branches, unless there is an absolute Want of Shoots to fill the Spaces of the Espalier; for where the Knife is much used, it only multiplies useless Shoots, and prevents their Fruiting; so that the best Method to manage these Trees is, to go over them 3 or 4 Times in the growing Season, and rub off all such Shoots as are irregularly produced, and train the others down to the Stakes, in the Position they are to remain; if this is carefully performed in Summer, there will be little left to be done in the Winter, and by bending their Shoots from Time to Time, as they are produced, there will be no Occasion to use Force to bring them down, nor any Danger of breaking the Branches. The Distance which these Branches should be trained from each other, for the largest Sorts, should be about 7 Inches, and for the smaller, 4 or 5. If these plain Instructions are followed, it will save much unnecessary Labour of Pruning, and the Trees will, at all Times, make a handsome Appearance, whereas when they are suffered to grow rude in Summer, there will be much greater Difficulty to bring down their Shoots, especially if they are grown stubborn. All the Sorts of Apples produce their Fruit on Cursons, or Spurs, so that these should never be cut off, for they will continue fruitful many Years.

The Method of making Espaliers having been already exhibited under that Article, I need not repeat it here, but only observe, that it will be best to defer making the Espalier, till the Trees have had 3 or 4 Years Growth, for before that Time, the Branches may be supported by a few upright Stakes, so that there will be no Necessity to make the Espalier, until there are sufficient Branches to furnish the lower Part.

I shall now treat of the Method to plant Orchards, so as to have them produce the greatest Profit. And first, in the Choice of the Soil and Situation. The best Situation for an Orchard is, on the Ascent of gentle Hills, facing the South, or South East, but this Ascent must not be too steep, lest the Earth should be washed down by hasty Rains. There are many Persons who prefer low Situations at the Foot of Hills, but I am thoroughly convinced from Experience, that all Bottoms where there are Hills on every Side, are very improper for this Purpose; for the Air is drawn down in strong Currents, which, being pent in on every Side, renders these Bottoms much colder, than open Situations; and during the Winter and Spring, these Bottoms are very damp, and unhealthy to all Vegetables; therefore the gentle Rise of a Hill, fully exposed to the Sun and Air, is by much the best Situation. As to the Soil, a gentle Hazel Loam, which is easy to work, and that doth not detain the Wet, is the best; if this happens to be 3 Feet deep, it will be the better for the Growth of the Trees, for although these Trees will grow upon very strong Land, yet they are seldom so thriving, nor are their Fruit so well flavoured, as those which grow on a gentle Soil; and on the other Hand, these Trees will not do well upon a very dry Gravel, or Sand; therefore those Soils should never be made Choice of for Orchards.

The Ground intended to be planted should be well prepared the Year before, by ploughing it thoroughly, and

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if some Dung is laid upon it the Year before, it will be of great Service to the Trees; if in the precedent Spring a Crop of Peas or Beans is planted on the Ground (provided they are sown or planted in Rows, at a proper Distance, so as that the Ground between them is Horse-hoed,) it will destroy the Weeds, loosen the Ground, and will be a good Preparation for the Trees, for the Earth cannot be too much wrought, or pulverized for this Purpose; these Crops will be taken off the Ground before the Season for planting the Trees, which should be done as soon as possible after the Trees begin to shed their Leaves.

In choosing the Trees, I would advise the taking such as are but of 2 Years Growth, from the Graft, and never to plant old Trees, or such as are grafted on old Stocks, for it is losing Time to plant these; young Trees being always more certain to grow, and make a much greater Progress than those which are old. As to pruning the Roots, it must be done as hath been already directed for the Espalier Trees; and in pruning their Heads, little more is necessary than to cut out such Branches as are ill placed, or that cross each other; for I do not approve the heading of them down, as is by some often practised to the Loss of many of their Trees.

The Distance which these Trees should be planted, where the Soil is good, must be 50 or 60 Feet; and where the Soil is not so good, 40 Feet may be sufficient; but nothing can be of worse Consequence, than crowding Trees too close together in Orchards: And although there may be some who may imagine this Distance too great, yet I am sure, when they have thoroughly considered the Advantages attending this Practice, they will agree with me. Nor is it my own Authority, for in many of the old Writers on this Subject, there is often Mention made of the Necessity for allowing a proper Distance to the Fruit Trees in Orchards; particularly in *Austen*, who says, *He should choose to prescribe the planting these Trees 14 or 16 Yards asunder; for both Trees and Fruits have many great Advantages, if planted a good Distance one from another.* One Advantage he mentions is, *The Sun refreshes every Tree, the Roots, Body, and Branches, with the Blossoms and Fruits; whereby Trees bring forth more Fruit, and those fairer and better.* Another Advantage he mentions is, *That when Trees are planted at a large Distance, much Profit may be made of the Ground under and about these Trees, by cultivating Garden Stuff, commodious as well for Sale as Housekeeping; also Gooseberries, Raspberries, Currants, and Strawberries, may be there planted.* Again he says, *When Trees have Room to spread, they will grow very large and great; and the Consequences of that will be, not only Multitudes of Fruits, but also long lasting, and these two are no small Advantages.* For, says he, *Men are mistaken, when they say, The more Trees in an Orchard, the more Fruits; for one or two large Trees, which have Room to spread, will bear more Fruits than six or ten (it may be) of those that grow near together, and crowd one another.* Again he says, *Let Men but observe, and take Notice of some Apple Trees, that grow a great Distance from other Trees, and have Room enough to spread both their Roots and Branches, and they shall see, that one of those Trees (being come to full Growth) hath a larger Head, and more Boughs and Branches, than (it may be) four, or six, or more, of those which grow near together, although of the same Age.*

And *Mr. Lawson*, an ancient Planter, advises to plant Apple Trees 20 Yards asunder. As the two Authors above quoted have written the best upon this Subject, and seem to have had more Experience than any of the Writers I have yet seen, I have made Use of them as Authorities to confirm what I have advanced; though the Fact is so obvious to every Person who will make the least Reflection, that there needs no other Proof.

When the Trees are planted, they should be staked, to prevent their being shaken, or blown out of the Ground by strong Winds; in doing this, there should be particular Care taken, to put either Straw, Haybands, or Woollen Cloth between the Trees and the Stakes, to prevent the Trees from being rubbed and bruised by shaking against the Stakes, for if their Bark should be rubbed off, it will occasion such Wounds, as are not to be healed over in several Years, if they ever recover it.

If the Winter should prove very severe, it will be proper to cover the Surface of the Ground about their Roots with some Mulch, to prevent the Frost from penetrating the Ground, which will endure the young Fibres; but this Mulch should not be laid on too soon, as hath been before-mentioned, lest the Moisture should be prevented from soaking down to the Roots of the Trees, nor should it lie on too long in the Spring, for the same Reason; therefore where Persons will be at the Trouble to lay it on in frosty Weather, and remove it again after the Frost is over, that the Wet in *February* may have free Access to the Roots of the Trees, and if *March* should prove dry, with sharp North or East Winds, which often happens, it will be proper to cover the Ground again with Mulch, to prevent the Winds from penetrating and drying the Ground, and will be of singular Service to the Trees. But I am aware, that this will be objected to by many, on Account of the Trouble, which may appear great; but when it is considered, how much of this Business may be done by a single Person in a short Time, it can have little Force, and the Benefit which the Trees will receive by it, will greatly recompence the Trouble and Expence.

As these Trees must be constantly fenced from Cattle, it will be the best Way to keep the Land in Tillage, for by constant ploughing or digging the Ground, the Roots of the Trees will be encouraged, and they will make the more Progress in their Growth; but where this is done, whatever Crops are sown or planted, should not be too near the Trees, lest the Nourishment should be drawn away from them; and as in ploughing the Ground there must be Care taken not to go too near the Stems of the Trees, whereby their Roots would be injured, or the Bark of their Stems rubbed off, so it will be of great Service to dig the Ground about the Trees, where the Plough doth not come, every Autumn, for 5 or 6 Years after planting, by which Time their Roots will have extended themselves to a greater Distance.

It is a common Practice in many Parts of *England*, to lay the Ground down for Pasture, after the Trees are grown pretty large in their Orchards; but this is by no Means advisable, for I have frequently seen Trees of above 20 Years Growth, almost destroyed by Horses, in one Week; and if Sheep are put into Orchards, they will constantly rub their Bodies against the Stems of the Trees, and their Grease sticking to the Bark, will stint the Growth of the Trees, and in Time spoil them; therefore where Orchards.

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Orchards are planted, it will be much the better Method to keep the Ground ploughed or dug annually, and such Crops put in it, as will not draw too much Nourishment from the Trees.

In pruning Orchard Trees, nothing more should be done, but to cut out all those Branches which cross each other, and, if left, would rub and tear off the Bark, as also decayed Branches, but never shorten any of their Shoots. If Suckers, or Shoots from their Stems, should come out, they must be entirely taken off, and when any Branches are broken by the Wind, they should be cut off, either down to the Division of the Branch, or close to the Stem from whence it was produced; the best Time for this Work is in November, for it should not be done in frosty Weather, nor in the Spring, when the Sap begins to be in Motion.

The best Method to keep Apples for Winter Use is, to let them hang on the Trees, until there is Danger of Frost; to gather them in dry Weather, and then lay them in large Heaps to sweat for 3 Weeks, or a Month; afterward look them over carefully, taking out all such as have Appearance of Decay, wiping all the sound Fruit dry, and pack them up in large Oil Jars, which have been thoroughly scalded and dry, stopping them down close, to exclude the external Air; if this is duly observed, the Fruit will keep sound a long Time, and their Flesh will be plump, for when they are exposed to the Air, their Skins will shrink, and their Pulp will be soft.

MALUS ARMENIACA. See Armeniaca.

MALUS AURANTIA. See Aurantia.

MALUS LIMONIA. See Limonia.

MALUS MEDICA. See Citreum.

MALUS PERSICA. See Persica.

MALUS PUNICA. See Punica.

MAMMEA. Plum. Nov. Gen. 44. Tab. 4. Lin. Gen. Plant. 583. The Mammee Tree.

The Characters are,

The Empalement is composed of 2 small, oval, concave Leaves, which fall off. The Flower has 4 large concave Petals, which spread open. It hath many Awl-shaped Stamina, terminated by roundish Summits, and in the Center a roundish Germen, with a conical Style the Length of the Stamina, crowned by a single permanent Stigma. The Germen turns to a large fleshy Fruit, of a spherical Figure, inclosing 1, 2, or 3 large Stones almost oval.

There is but one Species of this Tree in England, viz.

MAMMEA flaminibus flore brevioribus. Mammee with the Stamina shorter than the Flower. This is the *Mammee magno fructu, persica sapore*. Plum. Nov. Gen. 44. Mammee with a large Fruit, having the taste of a Peach.

This Tree, in the *West-Indies*, grows to the Height of 60 or 70 Feet; the Leaves are large, stiff, and continue green all the Year; the Fruit is as large as a Man's Fist; when ripe, it is of a yellowish green Colour, and very grateful to the Taste. It grows in great Plenty in the *Spanish West-Indies* where the Fruit is sold in the Markets, and esteemed one of the best Fruits of the Country. It also grows on the hills of *Jamaica*, and has been transplanted into most of the *Caribbee Islands*, where it thrives exceeding well.

In *England*, some few of these Plants, are preserved with great Care by such as are curious in cultivating exotick Plants; but there are none of any considerable Size,

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so that we cannot expect to see either Fruit or Flowers for some Years. These Plants may be propagated by planting the Stones, which are often brought from the *West-Indies* (but these Stones should be very fresh, otherwise they will not grow,) into Pots filled with fresh light Earth, and plunged into a hot Bed of Tanners Bark, observing to water the Earth whenever it appears dry. In about a Month or six Weeks the Plants will appear above Ground, after which they must be frequently refreshed with Water, and in hot Weather the Glasses of the hot Bed should be raised to let in fresh Air. In two Months the Roots of the Plants will have filled the Pots, when you should provide some Pots of a little larger Size, into which you should transplant them, being careful to preserve as much Earth to their Roots as possible; then you should fill up the Pots with fresh light Earth, and plunge them into the Bark Bed again, observing to water and shade them, until they have taken Root, after which they should be constantly refreshed with Water, as you shall find they want it, and must have Air in hot Weather. In this Bed they may remain till *Michaelmas*, when they must be removed into the Bark Stove, where they must be constantly kept, observing to refresh them with Water, but it must be given sparingly at this Season, as also to clean their Leaves from the Filth they are apt to contract in the Stove, and the Spring following they should be shifted into fresh Earth, and if they require it, into larger Pots, and must be constantly kept in the Bark Stove, and may be treated as directed for the Coffee Tree.

If, when the Stones of this Fruit are brought over, they are put into the Tan Bed, under the bottom of any of the Pots, they will sprout sooner than those which are planted in the Earth.

MANCANILLA. See Hippomane.

MANDRAGORA. Tourn. Inst. R. H. 76. Tab. 12. Lin. Sp. Plant. 221. Mandrake; in French, *Mandragore*.

The Characters are,

The Empalement of the Flower is large, Bell-shaped, erect, and permanent; it is of one Leaf, cut at the Top into five acute Segments. The Flower hath one erect Bell-shaped Petal which spreads open, and is a little larger than the Empalement. It has five Awl-shaped Stamina, which are arched and hairy at their Base. In the Center is situated a roundish Germen, supporting an Awl-shaped Style, crowned by a beaded Stigma. The Germen turns to a large round Berry with two Cells, having a fleshy Receptacle convex on each Side filled with Kidney-shaped Seeds.

We have but one Species of this Genus in England, viz.

MANDRAGORA. Hort. Cliff. 51. The Mandrake. This is the *Mandragora fructu rotundo*. C. B. P. 169. Mandrake with a round Fruit.

This Plant grows naturally in *Spain*, *Portugal*, *Italy*, and the *Levant*, but is preserved here in the Gardens of the Curious. It hath a long taper Root shaped like a Parsnep, which runs 3 or 4 Feet deep in the Ground; it is sometimes single, and at others divided into 2 or 3 Branches, almost the Colour of Parsnep, but a little darker; from this arises a Circle of Leaves, which at first stand erect, but, when grown to their full Size, spread open, and lie upon the Ground; they are more than a Foot in Length, and 4 or 5 inches broad in the Middle, growing narrow toward both Ends, of a dark green Colour, and a fetid Scent. These rise immediately from the

the Crown of the Root, without any Foot Stalk; between them come out the Flowers, each standing on a separate Foot Stalk about 3 Inches long, which also arise immediately from the Root; they are five cornered, of an herbaceous white Colour, spreading open at Top like a Primrose, having 5 hairy Stamina, with a globular Germen in the Center, supporting an Awl-shaped Style. The Germen afterwards turns to a globular soft Berry lying upon the Leaves, which when fully grown, is as large as a Nutmeg, of a yellowish green Colour when ripe, full of Pulp, in which the Kidney-shaped Seeds are lodged. It flowers in *March*, and the Seeds are ripe in *July*.

This Plant is propagated by Seeds, which should be sown upon a Bed of light Earth soon after they are ripe, for if they are kept until Spring, they seldom succeed well; but those which are sown in Autumn will come up in the Spring, when they should be carefully cleared from Weeds; and in very dry Weather, they must be refreshed with Water, which will greatly promote their Growth. In this Bed they should remain till the latter end of *August*, (observing always to keep them clear from Weeds;) at which Time they should be taken up very carefully, and transplanted into the Places where they are to remain, which should be a light deep Soil; for their Roots always run downward very deep, so that if the Soil be wet, they are often rotted in Winter; and if it be too near Gravel or Chalk, they seldom thrive well; but if the Soil be good and they are not disturbed, the Plants will grow to a large Size in a few Years, and will produce great Quantities of Flowers and Fruit, and abide a great many Years.

I have been informed by Persons of Credit, that one of these Roots will remain sound above 50 Years, and be as vigorous as a Young Plant. I have known some Plants near 40 Years myself which are now in great Vigour, and may continue so many Years longer, as there are no Signs of their Decay; but they should never be removed after their Roots have arrived to any considerable Size, which would break their lower Fibres, and so stint the Plants, that if they live, they will not recover their former Strength in two or three Years.

As to the Resemblance of a human Form, which the Roots of this Plant are said to carry, it is all Imposture, owing to the Cunning of Quacks and Mountebanks, who deceive the Ignorant with fictitious Images shaped from the fresh Roots of Briony and other Plants: And what is reported as to the Manner of rooting up this Plant, by tying a Dog thereto, to prevent the certain Death of the Person who should dare to attempt it, and the Groans it emits upon the Force offered, &c. is all a ridiculous Fable; for I have taken up several large Roots of it, some of which have been transplanted into other Places, but could never observe any particular Difference in this from any other deep rooting Plant.

MANIHOT. See *Jatropha*.

MANURE.

There are various Kinds of Manure, now commonly used in different Parts of *England*, for enriching the several Soils. Several of those have been already mentioned under the Article of *Dung*, so I shall not repeat them here, but proceed to take Notice of some other Kinds of Manure, which are at present neglected by most People; though they might be used with equal Success on

on many Lands, as most of those now commonly in Use.

Oak Bark, after the Tanners have used it for tanning of Leather, when laid in a heap and rotted, is an excellent Manure, especially for stiff cold Land; in which one Load of this Manure will improve the Ground more, and last longer, than two Loads of the richest Dungs; and yet it is very common to see large Heaps of this remaining in the Tanners Yards for many Years, in several Parts of *England*, where Manure of other Kinds is very scarce. Of late Years this Tan has been much used for hot Beds in several parts of *England*, and is found greatly to exceed Horse Dung for that Purpose, the Fermentation being moderate and of long Continuance; so that a Bed of Tan, when rightly made, will continue in a moderate Temperature of Heat for 3 or 4 Months; and when the Heat begins to decay, if it be stirred up with a Dung Fork, and some fresh Tan added to it, the Heat will renew again, and last for some Months, so that these Beds are by far the most kindly for exotick Plants; and whatever Plants are plunged into these Beds, if they are permitted to root through the Bottom of the Pots, they will thrive more in one Month, than they did in four Months while they were confined to the Pots. I have frequently observed many Kinds of Plants, which have rooted through the Pot into the Tan, and have sent forth Roots upwards of 12 Feet each Way, in less than 3 Months, and the Plants have advanced in Proportion; which is a plain Indication, that Plants are greatly nourished by the rotten Tan. After the Tan hath been used for a hot Bed, I have spread it on the Ground for Manure, and have found it has greatly enriched the Ground; but it is much better for cold strong Land, than for light hot Ground, because it is of a warm Nature, and will loosen and separate the Earth; so that where this Manure hath been used three or four Times, it hath made the Land very loose which before was strong, and not easy to be wrought. When this Manure is laid on the Grass, it should be done soon after *Michaelmas*, that the Winter Rains may wash it into the Ground; for if it is laid on in Spring, it will burn the Grass, and instead of improving, will greatly injure it for that Season. Where it is used for Corn Land, it should be spread on the Surface before the last Ploughing, that it may be turned down for the Fibres of the Corn to reach it in the Spring, for if it lies too near the Surface, it will forward the Growth of the Corn in Winter: But in Spring; when the Nourishment is chiefly wanted to encourage the Stems, it will be nearly consumed, and the Corn will receive little Advantage from it. Nor will it be proper to let this Manure lie too near the Plants, for I have frequently observed it prejudicial to many, but especially to bulbous and tuberose-rooted Flowers; which are very subject to rot, where it lies near their Roots; yet when it is buried just deep enough for the Fibres of their Roots to reach it in the Spring, the Flowers have been exceedingly improved by it: and where this Manure hath been used in Kitchen Gardens, it hath greatly improved the Vegetables; so that it is to be wondered, that this should not be employed on Land wherever it can be obtained.

Rotten Vegetables of most Sorts also greatly enrich Land, so that where other Manure is scarce, these may be used with great Success. The Weeds of Ponds, Lakes,

or

or Ditches, being dragged out before they feed, and lead in Heaps to rot, will make excellent Manure, as will most other Sorts of Weeds; but where-ever any of these are employed, they should be cut down as soon as they begin to flower, for if they are suffered to stand until their Seeds are ripe, the Land will be stored with Weeds, which cannot be destroyed in two or three Years; nay, some Kinds of Weeds, if they are permitted to stand so long as to form their Seed, will perfect them after they are cut down, which may be equally prejudicial to the Land: Therefore the surest Method is, to cut them down just as they begin to flower; at which Time most Sorts of Vegetables are in their greatest Vigour, being then stronger and fuller of Juice, than when their Seeds are farther advanced; so that at that Time they abound most with Salts, and therefore are more proper for the intended Purpose. In rotting these Vegetables, it will be proper to mix Earth, Mud, or such-like Substances with them, to prevent their taking Fire in their Fermentation; which they are very subject to, where they are laid in large Heaps without any other Mixture to prevent it; and it will be proper to cover the Heap over with Earth, Mud, or Dung, to detain the Salts, otherwise many of the finer Particles will evaporate in fermenting. When these Vegetables are thoroughly rotted, they will form a solid Mass, which will cut like Butter, and be very full of Oil, which will greatly enrich Land.

In Places where there are neither Ponds, Lakes, or Ditches, to supply these Weeds, and the Situation being far from the Sea (from whence also may be obtained many Sorts of Weeds for this Purpose,) there may be many Sorts of Vegetables sown, in order to plough them into the Grounds when they are full grown, to enrich the Land; at present those chiefly used for this Purpose are Buck Wheat, Vetches, and Spurry. And in some Countries Abroad they commonly sow Lupines upon such Land as they want to improve, and when they are full grown, they mow them down, and plough them into the Ground, which they esteem to be good Manure. This is chiefly used in the South of France and in Italy, where some of the Sorts of Lupines grow naturally; but these are not proper for this Climate, because, if the Season should prove cold or wet after the Lupines are sown, they will rot in the Ground, so that it may prove lost Labour to sow them here: and there being many other Sorts of Plants which are hardy, and grow to a much larger Size with us than Lupines, they should be preferred for this Purpose. I have known some Land sown pretty thick with Horse Beans, which have been mowed when they were in Blossom, and ploughed in for a Crop of Wheat, and it hath largely repaid the Owner. Almost any of the Pulse Kind, which grow large, are very proper to be sown for this Purpose; and next to these may be sown Mustard, Cole Seed, or any of these large growing Plants; which, if cut before they form their Seeds, and ploughed in, will greatly enrich the Ground.

The Refuse of the Kitchen Gardens, when laid in Heaps and rotted, will also afford a good Manure for Corn Land; but as this is not to be obtained in any Quantity, except near great Cities, so, in such Places, Dung being reasonable, the other will not be much sought after.

I have lately been informed of another Improvement, which may be of great Use in several Parts of the

Kingdom; which is the mowing down of Fern while it is green and tender, and laying it in Heaps to rot, which will make an excellent Manure for Land; and as this is a most troublesome Plant in many Parts of England, so by frequently mowing, it may be destroyed; and when rotted, a good Quantity of Manure may be obtained, which will more than defray the Charges of cutting it down. In some Places, where no Tan or Horse Dung can be obtained, they have cut down Fern, chopped it pretty small, and laid it in a Heap to ferment, then have used it for hot Beds, for which Purpose it has answered extremely well. The first Person who informed me of this, was Mr. Samuel Brewer, a very curious Gentleman in Gardening, who made several hot Beds of Fern, which, he says, continued their heat for many Months, so that he prefers it to Tan, or any Sort of Dung, where a moderate lasting Heat is required.

There are many other Kinds of Weeds which infest the Lands in England, which if cut down at a proper Time and laid to rot, might be used to great Advantage for manuring Land; and hereby the Weeds would in Time be destroyed, and the Manure would more than pay the Expence of doing it: But few Persons who are employed in Husbandry care to go out of their old beaten Road to try Experiments, even where they are attended with little Expence and no hazard; there is surely great Room to make Improvements of this Kind, especially in Countries where Dung, or other common Manure is very scarce; in which Places, if Experiments were properly made, of rotting whatever Vegetables could be procured in the Neighbourhood, a great Improvement might be made of the Land.

The Ashes of all Kinds of Vegetables are also an excellent Manure for Land, so that where the Ground is over-run with Bushes, Brambles, &c. which are woody, if they are grubbed up in Summer, and spread abroad to dry for a little Time, then gently consumed to Ashes, and these spread on the Land, it will greatly improve it. The Method for doing this is already explained under the Article of Land.

Rotten Wood, and Saw Dust when rotted, is a very good Manure for strong Land, because it loosens the Parts of the Earth and renders it light.

Bones, Horns, and other Parts of Animals enrich Land greatly, also decayed Fish; and where these can be easily obtained, great Improvements may be made of them.

Sea Sand and Shells are in several Parts of England used to great Advantage, especially in Devonshire, where they are at the Expence of fetching the Sand and Shells on Horses Backs, 12 or 14 Miles. The Land on which they lay this Manure, is a strong Loam inclining to Clay; this separates the Parts, and the Salts contained in the Manure are a very great Improvement of the Land. Coral, and such Kinds of stony Plants which grow on the Rocks, are filled with Salts which are very beneficial to Land; but as these Bodies are hard, the Improvement is not the first or second Year after they are laid on the Ground, because they require Time to pulverize them before their Salts can mix with the Earth to impregnate it. Therefore Dressings of this Kind are seldom used by Tenants, who want to reap the Fruit of their Labour as soon as possible. But these Manures are much better for

for cold strong Land, than for that which is light and sandy. In Countries at a great Distance from the Sea, have been discovered great Quantities of Fossil Shells, which have been dug out of the Earth, and used as Manure, which have improved the Ground; but these are not near so full of Salts as the Shells taken from the Shore, therefore where the latter can be obtained, they are to be preferred.

Where Land lies near the Sea, so that either Sand, Shells, Corals, Wracks, or Sea Weeds, can be obtained at an easy Expence, they are by far the best Kinds of Manure, because they enrich the Land for several Years; for as their Salts are closely locked up, they are communicated by degrees to the Land, as the Heat and Cold causes the Bodies to pulverize, and fall into small Parts; so that where Sand and smaller Kinds of Sea Weeds are used, if they are laid on Land in proper Quantities, it will enrich it for 6 or 7 Years: but Shells, Corals, and other hard Bodies, will continue many Years longer.

In dunging of Land, I have frequently observed in several Parts of *England*, but especially in *Cambridgeshire*, a very wrong Practice; for the Dung is laid on the Land before *Midsummer*, and spread perhaps a Month or six Weeks before the Ground is ploughed; in which Time the Sun exhales all the Goodness of the Dung, so that what remains is of little Service. Therefore when Dung or any other sort Manure is used, it should not be laid on the Ground until the last Time of Ploughing, when it should be buried as soon as possible, to prevent the Evaporation of the Salts. Indeed, where Shells, Corals, or any hard Substances are used for Manure, if these are spread abroad some Months before the Ground is ploughed, the Sun, Rain, or Frost, will cause them to pulverize much sooner than when they are buried, and excluded from the Air.

MAPLE. See Acer.

MARACOCK. See Passiflora.

MARANTA. *Plum. Nov. Gen. 16. Tab. 36. Lin. Gent. Plant. 5. Indian Arrow-root.*

The Characters are,

It hath a small 3 leaved Empalement sitting on the Germen; the Flower hath one Petal of the grining Kind, having an oblong compressed Tube, which is oblique and turned inward; the Rim is cut into 6 small Segments, representing a Lip Flower, the 2 Side Segments being the largest. It has one membranaceous Stamina, appearing like a Segment of the Petal, with a linear Summit fastened to the Border. It hath a roundish Germen situated under the Flower, supporting a simple Style the Length of the Petal, crowned by a 3 cornered Stigma. The Germen turns to a roundish 3 cornered Capsule with 3 Valves, containing one hard rough Seed.

The Species are,

1. MARANTA *segmentis petalorum dentatis.* Indian Arrow-root with the Segments of the Flower indented. This is the *Maranta Arundinacea cannicori folio.* *Plum. Maranta* with a Leaf of the Indian flowering Reed.

2. MARANTA *segmentis petalorum integerrimis.* Indian Arrow-root with the Segments of the Petals intire. This is the *Canna Indica, radice alba alexipharmica.* *Sloan. Cat. Jam. 122 Indian Arrow-root.*

The 1st Sort was discovered by Father *Plumier* in some of the *French Settlements in America*, who gave it

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the Name, in Honour of *Bartholomew Maranta*, an ancient Botanist. The Seeds were sent to *Europe* by the late Dr. *William Houstoun*, who found the Plant growing in Plenty near *La Vera Cruz* in *New Spain*.

This hath a thick fleshy creeping Root very full of Knots, from which arise many smooth Leaves 6 or 7 Inches long and 3 broad in the Middle, lessening toward each End, terminating in Points. They are of the Consistence and Colour of those of the Reed, and stand upon Reed-like Foot Stalks, which arise immediately from the Root; between these come out the Stalks, which rise near 2 Feet high; these divide upward into 2 or 3 smaller, and are garnished at each Joint with one Leaf of the same Shape with the lower, but are smaller. The Ends of the Stalks are terminated by a loose Bunch of small white Flowers, standing on Foot Stalks near 2 Inches long. The Flowers are cut into 6 narrow Segments, indented on their Edges; these sit upon the Embryo, which turns to a roundish 3 cornered Capsule, inclosing one hard rough Seed. It flowers here in *June* and *July*.

The other Sort was brought from the *Spanish* Settlements in *America*, into the Islands of *Barbadoes* and *Jamaica*, where it is cultivated in Gardens as a medicinal Plant, being a sovereign Remedy for the bite of Wasps, and to extract the Poison of the Manchineel Tree. The *Indians* apply the Root to expel the Poison of their Arrows, which they use with great Success. They take up the Roots and after cleansing them from Dirt, they mash them, and apply it as a Poultice to the wounded Part, which dispels the Poison and heals the Wound. It will also stop a Gangrene, if applied before it is gone too far, so that it is a very valuable Plant.

This Sort is very like the 1st, but the Flowers are smaller, and Segments of the Petals entire, in which their principal Difference consists; it flowers also at the same Time.

These Plants being Natives of a warm Country, are very tender, and therefore will not live in this Climate, unless they are preserved in Stoves. They may be propagated by their creeping Roots, which should be parted in the Middle of *March*, just before they begin to push out new Leaves. These Roots should be planted in Pots filled with light rich Earth, and plunged into a moderate hot Bed of Tanners Bark, observing now and then to refresh them with Water; but it must not be given to them in large Quantities, for too much Moisture will soon rot the Roots, when they are in an inactive State. When the green Leaves appear above Ground, the Plants will require more frequently to be watered, and they should have free Air admitted to them every Day in Proportion to the Warmth of the Season and the Heat of the Bed in which they are placed. As the Plants advance in Strength, they should have a greater share of Air, but they must constantly remain in the Stove plunged in the Tan, otherwise they will not thrive; for when the Pots are placed on Shelves in the Stove, the Moisture passes too soon from the Fibres, which generally are spread to the Sides and Bottoms of the Pots so that the Plants do not receive much Nourishment from the Water. But where they are constantly kept in the Tanners Bark, and have proper Air and Moisture, they will thrive, so as from a small Root to fill the Pot in which it was planted, in one Summer. About *Michaelmas* the first Sort will begin to decay, and in a short Time after the Leaves will die

die to the Ground; but the Pots must be continued all the Winter in the Bark Bed, otherwise the Root will perish; for although they are in an unactive State, yet they will not keep from shrinking very long, when taken out of the Ground; and if the Pots are taken out of the Tan, and placed in any dry part of the Stove, the Roots often shrivel and decay; but when they are continued in the Tan, they should have but little Water given to them when their Leaves are decayed, lest it rot them. The 1st Sort doth flower constantly in *July* or *August*, and will often produce ripe Seeds in *England*; but the 2d Sort doth not flower so constant, nor do the Flowers appear so conspicuous, being very small and of a short Duration. This Sort never hath produced any Seeds in *England*, nor could I ever observe any Rudiment of a Seed Vessel succeeding the Flower. The green Leaves abide on this Sort most Part of the Winter, seldom decaying till *February*; and sometimes will continue green until fresh Leaves come up, and thrust the old ones off; in which Particular there is a more remarkable Difference between the two Sorts, than can be observed in the Face of the Plants.

MARJORAM. See *Origanum*.

MARLE is a Kind of Clay, which is become fatter, and of a more enriching Quality, by a better Fermentation, and by its having lain so deep in the Earth as not to have spent or weakened its fertilizing Quality by any Product.

Marle is supposed to be much of the Nature of Chalk, and is believed to be fertile from its salt and oily Quality; and that it contracts its Salts from the Air, and for that Reason is the better, the longer it is exposed to it.

Marles are of different Qualities in different Counties of *England*. There are reckoned to be four Sorts of Marles in *Staffordshire*, a gray, a blue, a yellow and a red; of these the blue is accounted the best, the yellow the next, and the gray the next to that; and as for the red, that is the least valuable.

The Marle in *Staffordshire* is most like Fullers Earth, and therefore must certainly be the fattest, whereas that in the North Country runs more upon the Loam.

In *Cheshire* they reckon six Sorts of Marle:

1. The Cowshut Marle, which is of a brownish Colour, with blue Veins in it, and little Lumps of Chalk or Lime Stone; it is commonly found under Clay, or low black Land, 7 or 8 Feet deep, and is very hard to dig.

2. Stone, Slate, or Flag Marle, which is a Kind of soft Stone, or rather Slate, of a blue or bluish Colour, that will easily dissolve with Frost or Rain. This is found near Rivers, and the Sides of Hills, and is a very lasting Sort of Marle.

In *Staffordshire* they esteem the Dice or Slate Marle better than the Clay Marle, and reckon the blue best for arable Land, and the gray for Pasture.

3. Peat Marle, or Delving Marle, which is close, strong, and very fat, of a brown Colour, and is found on the Sides of Hills, and in wet or boggy Grounds, which have a light Sand in them about two Feet or a Yard deep. This is accounted the strongest of all Marles, and is very good for sandy Land, but the Land must have a double Quantity laid on.

4. Clay Marle; this resembles Clay, and is pretty near akin to it, but is fatter and sometimes mixed with Chalk Stones.

5. Steel Marle, which lies commonly in the Bottom of Pits that are dug, and is of itself apt to break into cubical Bits; this is sometimes under sandy Land.

6. Paper Marle, which resembles Leaves or Pieces of brown Paper, but something of a lighter Colour; this lies near Coals. This Sort is less esteemed, it being hard to be got.

The Properties of any Sorts of Marles, and by which the Goodness of them may be best known, are better judged of by their Purity and Uncompoundedness, than their Colour: As if it will break in Pieces like Dice, or into thin Flakes, or is smooth like Lead Ore, and is without a mixture of Gravel or Sand; if it will shake like Slate Stones, and shatter after Wet, or will turn to Dust when it has been exposed to the Sun; or will not hang and stick together when it is thoroughly dry, like tough Clay; but is fat and tender, and will open the Land it is laid on, and not bind; it may be taken for granted, that it will be beneficial to it.

Some advise, to try the Goodness of Marle, by putting some of it into a Glass of Water; and they account it to be good, if it be so tender, that the Lumps break and dissolve as soon as it comes to the Bottom; they also reckon it a good Sign, if it sparkle in the Water, and feel fat between the Fingers; but the surest Sign of its Goodness is, if it dissolve by Wet or Frost. The Strength of Marle may also be known, by putting a Lump of it into a Glass of good Vinegar, where, if the Fermentation is great, it is a sure Sign of the Goodness of the Marle.

Some approve of marling Land shallow, because they say, it is apt to work downwards; others of laying it in deep at first, because the Sun wastes the Fatness of it.

Some recommend Marles for the improving of sandy loose Land, but the surest Way to know what Lands it will best suit with, is to try with a little of it on Lands supposed to be of a contrary Nature to it.

Marles do not make so good an Improvement of Lands the first Year, as afterwards.

Some advise, first to burn the Marle before it is laid on the Lands; which if it be done, one Load will go as far as five.

The Quantity of Marle ought to be in Proportion to the Depth of the Earth, and over Marling has often proved of worse Consequence than under Marling, especially where the Land is strong; for by laying it in too great Quantities, or often repeating the Marling, the Land has become so strong and bound so closely, as to detain the Wet like a Dish, so that the Owners have been obliged to drain the Ground at a great Expence; but in sandy Land there can be no Danger in laying on a great Quantity, or repeating it often, for it is one of the best Dressings for such Land.

MARRUBIASTRUM, Bastard Horehound. See *Sideritis*. **MARRUBIUM.** *Tourn. Inst. R. H.* 192. *Tab.* 91. *Lin. Gen. Plant.* 640. *Pseudodictamnus.* *Tourn.* 188. *Tab.* 89. *Lin. Gen. Plant.* 640. Horehound.

The Characters are,

The Empalement of the Flower is Funnel-shaped, of one Leaf, and equal at the Brim, which spreads open. The Flower is of the Lip Kind, with a cylindrical Tube opening at the Brim, where it is divided into 2 Lips, the upper being very narrow and acute, the under broad, reflexed, and cut into 3 Segments, the middle one is broad and indented.

It has 4 Stamina which are under the upper Lip, 2 of which are a little longer than the other, terminated by simple Summits. It hath a 4 pointed Germen, supporting a slender Style of the same Length, and situated with the Stamina, crowned by a bifid Stigma. The Germen turns to four oblong Seeds, sitting in the Empalement.

The Species are,

1. MARRUBIUM. *dentibus calycinis setaceis uncinatis*. H. C. 312. Horehound, with hooked bristly Indentures to the Empalement. This is the *Marrubium album vulgare*. C. B. P. 230. Common white Horehound.
2. MARRUBIUM *foliis ovato lanceolatis serratis, calycum denticulis setaceis*. H. C. 311. Horehound with oval Spear-shaped sawed Leaves, and bristly Indentures to the Empalement. *Marrubium album latifolium peregrinum*. C. B. P. Broad leaved foreign white Horehound.
3. MARRUBIUM *foliis lanceolatis dentatis, verticillis minoribus, dentibus calycinis setaceis erectis*. Horehound with Spear-shaped indented Leaves, smaller Whorls, and erect bristly Indentures to the Empalements. This is the *Marrubium album angustifolium peregrinum*. C. B. P. 230. Narrow leaved foreign white Horehound.
4. MARRUBIUM *foliis cuneiformibus, verticillis involucri destitutis*. Hort. Cliff. 311. Horehound with Wedge-shaped Leaves, and the Whorls destitute of Coats. This is the *Marrubium alyssum dictum, foliis profunde incis.* H. L. Horehound called Madwort, with Leaves which are deeply cut.
5. MARRUBIUM *dentibus calycinis setaceis rectis villosis*. Hort. Cliff. 312. Horehound with hairy, erect bristly Indentures to the Empalement. This is the *Marrubium Hispanicum supinum, foliis sericeis argenteis*. Tourn. 193. Low Spanish Horehound, with silken Silver coloured Leaves.
6. MARRUBIUM *foliis subovatis lanatis supernè emarginato-crenatis, denticulis calycinis subulatis*. Hort. Cliff. 312. Horehound with woolly Leaves almost oval, the upper Parts of which are indented and crenated, with Awl-shaped Indentures to the Empalements. This is the *Marrubium album candidissimum & villosum*: Tourn. Cor. 12. Whitest and villose Horehound.
7. MARRUBIUM *calycum limbis patentibus, denticulis acutis*. Hort. Cliff. 312. Horehound with spreading Borders to the Empalement, and acute Indentures. This is the *Marrubium album rotundifolium Hispanicum*. Par. Bat. 201. Round leaved Spanish Horehound.
8. MARRUBIUM. *foliis subovatis tomentosis supernè serratis, denticulis calycinis setaceis erectis*. Horehound with woolly Leaves which are almost oval, and sawed at Top, with bristly and erect Indentures to the Empalement. This is the *Marrubium folio rotundo candidissimo*. Boerb. Ind. alt. Whitest round leaved Horehound.
9. MARRUBIUM *foliis orbiculatis crenatis tomentosis, verticillorum involucri setaceis villosis*. Horehound with woolly orbicular Leaves which are crenated, and the Coats of the Whorls bristly and hairy. This is the *Marrubium album, foliis amplis ferè circinatis*. Phil. Transf. No. 395. White Horehound with large Leaves which are almost round.
10. MARRUBIUM *calycum limbis planis villosis, foliis orbiculatis rugosis, caule herbaceo*. Horehound with a plain hairy Border to the Empalement, round rough Leaves, and an herbaceous Stalk. This is the *Pseudodictamnus*

Hispanicus, foliis crispis & rugosis. Tourn. Inst. Spanish Bastard Ditany, with rough curled Leaves.

11. MARRUBIUM *calycum limbis planis villosis, foliis cordatis rugosis incanis, caule suffruticoso*. Horehound with the Border of the Empalement plain and hoary, Heart-shaped rough hoary Leaves, and a shrubby Stalk. This is the *Pseudodictamnus Hispanicus, amplissimo folio candicante & villosa*. Tourn. Inst. R. H. 188. Spanish Bastard Dittany, with a very large hoary Leaf.

12. MARRUBIUM. *calycum limbis planis villosis, foliis cordatis, caule fruticoso*. Hort. Cliff. 312. Horehound with a plain hairy Border to the Empalement, Heart-shaped Leaves and shrubby Stalk. This is the *Pseudodictamnus verticillatus inodorus*. C. B. P. 232. Whorled unfavoury Bastard Dittany.

13. MARRUBIUM *dentibus calycinis setaceis, involucri villosis, foliis cordatis serratis, subtus tomentosis petiolis longioribus*. Horehound with bristly Indentures to the Empalement, hairy Coats, and Heart-shaped sawed Leaves which are woolly on their under Side, and have long Foot Stalks. This is the *Pseudodictamnus Hispanicus, serophularia folio*. Tourn. Inst. R. 188. Bastard Dittanny of Spain with a Figwort Leaf.

14. MARRUBIUM *calycum limbis planis villosis foliis, ovato-cordatis obtusè crenatis caule suffruticoso hirsutissimo*. Horehound with a plain hairy Border to the Empalement, oval Heart-shaped Leaves which are obtusely crenated, and a very hairy shrubby Stalk. This is the *Pseudodictamnus Hispanicus amplissimo folio nigricante & villosa*. Tourn. Inst. 188. Spanish Bastard Dittany, with a very large, blackish, hairy Leaf.

15. MARRUBIUM *calycum limbis tubo longioribus membranaceis, angulis majoribus rotundatis*. Lin. Sp. Plant. 584. Horehound with a membranaceous Rim to the Empalement longer than the Tube, and larger rounder Angles. This is the *Pseudodictamnus acetabulis Moluccæ*. C. B. P. 222. Bastard Dittany, with a Pan or Hollow of *Molucca Baum*.

The 1st Sort is the *Prasum*, or white Horehound of the Shops. This grows naturally in most Parts of England, so is seldom propagated in Gardens. It hath a ligneous fibrous Root, from which come out many square Stalks, a Foot or more in Length, which branch out upward, and are garnished with hoary roundish Leaves, indented on the Edges, placed opposite by Pairs. The Flowers grow in very thick Whorls round the Stalks at each Joint; they are small, white, and of the Lip Kind, standing in stiff hoary Empalements, cut into ten Parts at the Top, which end in stiff Bristles; these are succeeded by four oblong black Seeds, sitting in the Empalement. It flowers in June, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in Italy and Sicily; this rises with square Stalks near 3 Feet high, which branch much more than the 1st; the Leaves are rounder, whiter, and stand farther asunder; the Whorls of Flowers are not so large, but the Flowers have longer Tubes.

The 3d Sort grows naturally in Spain and Portugal; this rises with slender hoary Stalks near 3 Feet high, the Leaves are very hoary, much longer and narrower than those of the 2d; the Whorls of Flowers are smaller, the bristly Indentures of the Empalement are longer and erect; the whole Plant has an agreeable Flavour.

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The 4th Sort grows naturally in *Spain* and *Italy*; this is a biennial Plant, the Stalks are about the same Length as those of the 1st; the Leaves are Wedge-shaped, hoary, and obtusely indented; the Whorls of Flowers are small, and have no Covers. The Flowers stand looser in the Whorls, and the Cuts of the Empalement end in very stiff Prickles which spread open; the Flowers are purple, and larger than those of the first Sort.

The 5th Sort grows naturally in the Islands of the *Archipelago*; the Stalks of this are seldom above 8 or 9 Inches long, covered with a soft hoary Down; the Leaves are small roundish, and very soft to the Touch; they are hoary, and indented on the Edges. The Whorls of Flowers are small, very downy and white; the Flowers are small and white.

The 6th Sort grows naturally in *Spain*; this hath Stalks about the same Length as the first, the Leaves are nearly oval, woolly, and crenated toward the Top, and the Empalement of the Flowers Awl-shaped.

The 7th Sort grows naturally in *Isfria*, from whence I received the Seeds. The Stalks of this grow more erect than those of the common Sort, the Leaves are rounder and more sawed on the Edges; the Empalement of the Flowers spread open, ending in acute Segments. The Flowers are like those of the common Sort; the whole Plant is very hoary.

The 8th Sort grows naturally in the *Levant*; the Stalks of this Sort are very woolly, the Leaves almost oval, thick, and indented on their Edges toward the Top; their foot Stalks are broad, the Whorls of Flowers large, and the Indentures of the Empalements end in stiff Bristles; the whole Plant is very white.

The 9th Sort grows naturally about *Smyrna*, from whence the late Dr. *Sherard* sent the Seeds to *England*. The Stalks of this are much stronger than those of the first, and stand erect; the Leaves are larger than any of the other Species; they are of a thick Consistence, almost round, crenated on their Edges, and woolly. The Whorls of Flowers are very large, and have bristly Coats; the Tube of the Flowers is longer, and the Flowers larger than those of the common Sort, but this seldom produces good Seeds in *England*.

The 10th Sort grows naturally in *Spain* and *Sicily*; this sends out many stiff roundish Stalks, which rise more than 2 Feet high, and are covered with a white cottony Down; the Leaves are almost round, rough on their upper Side, and woolly on their under; the Whorls of Flowers are large, the Borders of the Empalement flat and hairy; the Tube of the Flower is scarce so long as the Empalement, so the two Lips are but just visible.

The 11th Sort grows naturally in *Spain*; the Stalks of this are a little shrubby, and rise near 3 Feet high, dividing into small Branches; the Leaves are Heart-shaped and rough on their upper Side, but hoary on their under; the Whorls of Flowers are large, the Borders of the Empalements flat and hairy; the Tube of the Flower is longer, and the Flowers larger than those of the former Sort; they are of a pale purple Colour, and their upper Lips erect.

The 12th Sort grows naturally in *Sicily*, and the Islands of the *Archipelago*. This rises with a shrubby Stalk 2 Feet high, which divides into many Branches, garnished with small Heart-shaped Leaves, sitting pretty

close to the Stalks; the Whorls of Flowers are not so large as those of the two former Sorts. The Rim of the Empalements are flat. The Flowers white, and the whole Plant is very hoary.

The 13th Sort grows naturally in *Spain*; the Root is ligneous; the Stalks square and hairy; the Leaves Heart shaped, sawed on their Edges, woolly on their upper Side, and have long Foot Stalks. The Empalement of the Flower has the Indentures terminating in Bristles; the Cover of the Whorls is hairy, the Tube of the Flower is longer than the Empalement, the Flowers are purple, and their upper Lips erect.

The 14th Sort grows naturally in *Spain*; this sends out from the Root many ligneous Stalks, rising near 3 Feet high, which are roundish and very hairy. The Leaves are oval, Heart-shaped, obtusely crenated on their Edges, and have long Foot Stalks. The Whorls of Flowers are large; the Borders of the Empalements flat, and very hairy. The Flowers are small, and of a pale purple Colour.

The 15th Sort grows naturally in *Crete*; this hath very hairy Stalks, which rise about 2 Feet high, garnished with Heart-shaped Leaves, rough on their upper Side, but hoary on their under. The Whorls of Flowers are large, the Borders of the Empalements flat, and cut into many Segments, which are membranaceous, angular, and rounded at the Top. The Flowers are small, of a pale purple Colour, but scarce appear out of their Empalements, and their upper Lips erect.

The first Sort is what the College of Physicians has directed to be used in Medicine. The Leaves and Tops of the Plants are esteemed hot and dry, pectoral, and good to free the Lungs from thick viscid Phlegm, and thereby to help old Coughs, especially in cold moist Constitutions, the Juice being made into a Syrup with Sugar or Honey; they open Obstructions of the Liver and Spleen, and are very serviceable against the Dropsy, Jaundice, Green Sickness, and Obstructions of the *Catamenia*, and Suppression of the *Lechia*, and other Distempers of the female Sex, for which few Herbs go beyond this. The officinal Preparation is the *Syrupus de Prassia*.

The 4th Sort is supposed to be *Galen's* Madwort; this was by the Ancients greatly recommended for its Efficacy in curing Madness, and some few of the Moderns have prescribed it in the same Disorder, but at present it is seldom used.

All these Plants are preserved in Botanic Gardens for Variety, but there are not above two of the Sorts, which are cultivated in other Gardens; these are the 12th and 15th Sorts, whose Stalks are shrubby, and the Plants very hoary, so make a variety when intermixed with other Plants; these very rarely produce Seeds in *England*, so are propagated by Cuttings, which, if planted in a shady Border the Middle of *April*, will take Root very freely.

They are somewhat tender, so in very severe Winters are killed, unless screened from hard Frosts, especially those in good Ground, where they grow luxuriant in Summer, so their Branches are more replete with Juice, and very liable to suffer by Cold; but when they are in a poor dry rubbishy Soil, the Shoots will be short, firm, and dry, so are seldom injured by the Cold, and these will continue much longer than those in better Ground.

The other Sorts are easily propagated by Seeds, which

which should be sown on a Bed of dry poor Earth in Spring, and when the Plants come up, they must be kept clean from Weeds, and where they are too close should be thinned, to about 18 Inches asunder, that their Branches may have Room to spread, after this they require no other Culture; they may also be propagated by Cuttings as the two other Sorts. If these Plants are upon a dry poor Soil, they will live several Years, but in rich Land they seldom last above three or four.

MARRUBIUM NIGRUM. See Ballote.

MARTAGON. See Lilium.

MARTYNIA. *Houss. Gen. Nov. Martyn. Dec. 1. 42.*

[This Name was given by the late Dr. *Housson* in Honour of his Friend *John Martyn*, Professor of Botany at Cambridge.]

The Characters are,

The Emplacement of the flower is cut into 5 Parts 3 of them are erect, and 2 reflexed. The Flower hath one Petal, which is Bell-shaped, with a large swelling Tube, at the Base of which is situated a gibbous Nectarium. The Rim of the Petal is cut slightly into 5 obtuse Segments, 2 of which are turned upward, the other 3 downward, representing a Lip Flower. It hath 4 slender incurved Stamina, inflexed into each other, and terminated by Summits, connected together. It hath an oblong Germen situated under the Flower, supporting a short Style, crowned by a plain Stigma. The Emplacement turns to an oblong gibbous Capsule, which divides into 2 Parts, including a hard Nut shaped like the Body of a Stag Beetle, with 2 incurved strong Horns at the End, having 4 Cells, 2 of which are generally barren, the other 2 have one oblong Seed in each.

The Species are,

1. MARTYNIA caule ramoso, foliis angulatis. *Lin. Sp.* Martynia with a branching Stalk, and angular Leaves. This is the *Martynia annua villosa & viscosa, folio subrotunda, flore magno rubro. Houss.* Annual hairy viscous Martynia, with a roundish Leaf, and a large red Flower.

2. MARTYNIA caule simplici, foliis serratis. *Lin. Sp.* Plant. 618. Martynia with a single Stalk, and sawed Leaves.

The first of these Plants was discovered by the late Dr. *Housson* near *La Vera Cruz*, in *New Spain*, from whence he sent the Seeds to *England*, which succeeded very well in the Physick Garden at *Chelsea*; and in the Year 1731. several of these Plants were raised, which produced their beautiful Flowers, and perfected Seeds, from whence several Plants were raised the succeeding Year.

This rises with a strong herbaceous hairy Stalk, near 2 Feet high, which divides upward into 2 or 3 large Branches, which rise upward of 3 Feet high, and are garnished with oblong oval Leaves cut into Angles on their Sides; they are 5 Inches long, and 3 and a Half broad at their Base, where they are broadest, ending in obtuse Points; they are hairy and very viscous, sticking to the Fingers if handled. The Flowers are produced in short Spikes, from the End of the Branches; they are shaped like those of the common Foxglove, but are of a paler purple Colour; these are succeeded by oblong oval Capsules, which are thick, tough, and clammy; these when ripe, divide into two Parts, leaving a large hard Nut hanging on the Plant, about the Size and much of the same Form as the Stag Beetle, with 2 strong crooked Horns at the End. The Nut has 2 deep longitudinal Furrows on the Sides, and several smaller crossing each other in the Mid-

dle. It is so hard, that it is with Difficulty cut open, without injuring the Seeds; within are 4 oblong Cells, 2 of which have a single oblong Seed in each, but the other 2 are abortive. If the Plants are brought forward in the Spring, they will begin to shew their Flowers in *July*, which are first produced at the Division of the Branches, and afterward at the Extremity of each Branch, to there will be a Succession on the same Plant till the End of *October*, when the Plants decay.

The 2d Sort was discovered by Mr. *Millar*, growing naturally about *Cartagena*, in *New Spain*, from whence he sent the Seeds to *Europe*; this hath a perennial Root, and an annual Stalk, which decays every Autumn, and new ones arise in the Spring. The Roots are thick, fleshy, and divided into Knots, which are scaly, somewhat like those of Toothwort; these send up several Stalks, which grow about a Foot high; they are thick, succulent, and of a purplish Colour, garnished with oblong thick Leaves, whose Base fits close to the Stalk; they are sawed on their Edges, rough on their upper Side, where they are of a dark green, but their under Side is purplish. The Stalk is terminated by a short Spike of blue Flowers, which are Bell-shaped, and do not spread open at the Rim so much as the former Sort; these usually appear in *July* or *August*, but are not succeeded by Seeds in *England*.

The 1st Sort, being an annual Plant, is only propagated by Seed, which should be sown in Pots filled with light rich Earth, and plunged into a hot Bed of Tanners Bark, where (if the Earth is duly watered to promote the Vegetation of the Seed) the Plants will appear in about 3 Weeks, or a Month, and will grow pretty fast, if the Bed is warm; they should therefore be transplanted in a little Time after they come up, each into a separate Pot filled with light rich Earth, and then plunged into the hot Bed again, observing to water them well, as also to shade them from the Sun, until they have taken new Root, after which they should have a large Share of fresh Air admitted to them in warm Weather, by raising the Glasses of the hot Bed every Day, and the Plants must be frequently watered; with this Management they will make great Progress, so as to fill the Pots with their Roots in about a Month's Time, when they should be shifted into Pots, about a Foot Diameter at the Top, which should be filled with light rich Earth, and then plunged into the hot Bed in the Bark Stove, where they should be allowed Room, because they put out many Side Branches, and will grow 3 Feet high or more, according to the Warmth of the Bed, and the Care which is taken to supply them constantly with Water; they must be constantly kept in the Tan Bed, giving them Plenty of free Air at all Times when the Weather is warm, but they will not bear to be exposed abroad in this Country; when these Plants thrive well, they will send out many Side Branches, which will all of them produce small Spikes of Flowers; but it is only from the first Spike of Flowers that good Seeds can be expected in this Country, so that particular Care should be taken, that none of those are pulled off or destroyed, because it is very difficult to obtain good Seeds here, and I believe few of those that are produced on the Side Branches in the natural Country of their Growth, are duly ripened, for I have received a great Quantity of these Seeds from Abroad, which have appeared to be very good, and yet few of them have grown.

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The Seeds of these Plants have a strong green Covering on them, as thick as the outer Covering of an Almond, and when the Seeds are ripe, the Covering opens, and lets the Seeds fall, in the same Manner as the Covering of Almonds, Walnuts, &c. In each Covering there is one hard Nut, in Shape somewhat like a Beetle, having 2 sharp crooked Horns at one End. This Nut contains 4 Embryos, but there are seldom more than 2 Seeds which are perfect in any of them. However, when they are sown, the whole Nut must be planted, for it is so hard, that it is impossible to take out the Seeds without spoiling them, and where there are 2 Plants produced from the same Nut, they are easily separated, when they are transplanted; these Seeds will continue good for some Years, for I saved a pretty large Quantity of them in the Year 1734, Part of which I sowed the following Year, but had not one Plant produced; the Remainder of the Seeds I divided, and sowed some of them every succeeding Year, without any Success, until the Year 1738, when I sowed all the Seeds I had left, from which I had one Plant produced; so that if the Seeds are good, it is evident they will grow when they are 4 Years old; therefore, whenever we receive good Seeds from Abroad, or save any in this Country which are perfectly ripened, it will be proper to preserve some of them for a Year or two, lest a bad Season should happen, when the Plants may not perfect their Seeds, so that if this Precaution be not taken, the Species may be lost in Europe.

The 2d Sort dies to the Root every Winter, and rises again the succeeding Spring; this must be constantly preserved in the Stove, and plunged into the Bark Bed, otherwise it will not thrive in this Country. During the Winter Season, when the Plants are decayed, they should have but little Water, for at that Time it will rot the Roots. In the Beginning of March, just before the Plants begin to shoot, is the proper Season to transplant and part the Roots, when they should be planted into Pots of a middle Size, filled with light rich Earth, and then plunged into the Bark Bed, which should at this Time be renewed with fresh Tan. When the Plants come up, they must be frequently refreshed with Water, but it must not be given in large Quantities, lest it rot their tender Roots; and as the Warmth of the Season increases, it will be proper to admit a large Share of fresh Air, which will greatly strengthen the Plants; they must also be placed in the Tan Bed, where they are not over hung, or shaded by other Plants; nor should they be shifted or transplanted when they are in Leaf, for that will prevent their flowering. As the Roots of this Plant increase very fast, there is no Necessity for using other Methods to propagate it, otherwise the Shoots of the young Stalks will take Root, if they are planted in Pots filled with light Earth, and plunged into a hot Bed during any of the Summer Months.

MARVEL OF PERU. See *Mirabilis*.

MARUM. See *Teucrium*.

MARUM VULGARE. See *Satureja*.

MARYGOLD. See *Calendula*.

MARYGOLD (AFRICAN). See *Tagetes*.

MARYGOLD (FIG). See *Mesembryanthemum*.

MARYGOLD (FRENCH). See *Tagetes*.

MASTERWORT. See *Imperatoria*.

MASTICHINA. See *Satureja*.

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MATRICARIA. *Tourn. Inst. R. H. 493. Tab. 281. Lin. Gen. Plant. 867.* [so called from the *Matrix*, because this Plant is very good against Diseases of the Womb; it is also called *Parthenium*, of *Πάρθενον*, a Virgin.] Feverfew; in French, *Matricaire*.

The Characters are,

It hath a compound Flower. The Ray, or Border, is composed of many female half Florets; and the Disk, which is hemispherical, of hermaphrodite Florets; these are included in one common hemispherical Empalement, composed of linear Scales nearly equal. The female half Florets are Tongue-shaped, and indented in 3 Parts at the End; these have a naked Germen, supporting a slender Style, terminated by 2 twisted Stigmas. The hermaphrodite Florets are tubulous, Funnel-shaped, and cut into 5 Parts at the Brim, which spread open; they have each 5 hairy short Stamina, terminated by cylindrical Summits, and an oblong naked Germen, with a slender Style, crowned by a bifid spreading Stigma. The Germen of both turn to single oblong naked Seeds.

The Species are,

1. MATRICARIA *foliis compositis planis, foliolis ovatis incisis, pedunculis ramosis. H. C. 416.* Feverfew with plain compounded Leaves, whose Lobes are oval and cut and branching Foot Stalks. This is the *Matricaria vulgaris, seu sativa. C. B. P. 133.* Common or Garden Feverfew.

2. MATRICARIA *receptaculis hemisphaericis, foliis bipinnatis subcarnosis, supra convexis, subtus carinatis. Lin. Sp. Plant. 891.* Feverfew with hemispherical Receptacles, double winged Leaves, which are fleshy, and convex on their upper Side, and Keel-shaped below. This is the *Chamamelum maritimum perenne humilis, foliis brevioribus crassis obscure virentibus. Raii. Syn. Ed. 3. p. 186.* Dwarf perennial maritime Chamomile with short thick dark green Leaves.

The 1st Sort is the common Feverfew, which is directed to be used in Medicine. It grows naturally in Lanes, and upon the Side of Banks, in many Parts of England, but is frequently cultivated in the Physick Gardens to supply the Markets; this is commonly a biennial Plant, which decays soon after it has perfected Seeds. The Root of this Plant is composed of a great Number of Fibres, which spread wide on every Side. The Stalks rise upward of 2 Feet high; they are round, stiff, and striated, branching out on every Side. The Leaves are composed of 7 Lobes, which are cut into many obtuse Segments; they are of a yellowish green Colour. The Stalks and Branches are terminated by the Flowers, which are disposed almost in the Form of loose Umbels, each Flower standing upon a separate Foot Stalk about 2 Inches long. The Flowers are composed of several short Rays, which are white like those of the Chamomile, surrounding a yellow Disk composed of hermaphrodite Florets, which form a Hemisphere; these are inclosed in one common scaly Empalement, and are succeeded by oblong angular naked Seeds. It flowers in June, and the Seeds ripen in Autumn. The whole Plant has a strong unpleasant Odour. The Leaves and Flowers are used in Medicine, and are particularly appropriated to the female Sex, being of great Service in all Cold flatulent Disorders of the Womb, and histerick Affections, procuring the *Catamenia*, and expelling the Birth and Secundines.

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The following Varieties of this Plant, are preserved in Botanic Gardens, many of which are pretty constant, if Care is taken in saving the Seeds; but where the Seeds have been suffered to scatter, it will be almost impossible to preserve the Varieties without Mixture; but if the Seeds are sown upon a fresh spot of Ground, where there has not grown any of the Plants before, I am inclinable to believe they will produce the same Plants as those they were taken from, however as they are supposed to be only Varieties, so I shall only just insert them here, for those who are curious in collecting the Varieties.

1. Feverfew with very double Flowers.
2. Feverfew with double Flowers, whose Borders, or Rays, are plain, and the Disk fistular.
3. Feverfew with very small Rays.
4. Feverfew with very short fistular Florets.
5. Feverfew with naked Heads, having no Rays.
6. Feverfew with naked Sulphur-coloured Heads.
7. Feverfew with elegant curled Leaves.

These Plants are propagated by Seeds, which should be sown in March, upon a Bed of light Earth; when they come up they should be transplanted into Nursery Beds, at about 8 Inches asunder, where they may remain till the Middle of May, when they may be taken up, with a Ball of Earth to their Roots, and planted in the Middle of large Borders, where they will flower in July and August, and, if the Autumn be favourable, will produce ripe Seeds the same Year. But it is not advisable to permit them to seed, which often weakens and decays the Roots, therefore, when their Flowers are past, you should cut down their Stems, which will cause them to push out fresh Heads, whereby the Roots will be maintained.

When the Varieties of these Plants are intermixed with other Plants of the same Growth, they make a handsome Appearance during their Season of flowering, which commonly continues a full Month, or more, and renders them very valuable. But as their Roots seldom abide more than 2 or at most 3 Years, fresh Plants should be raised from Seeds, to supply their Places, for although they may be propagated by parting their Roots in Spring or Autumn, yet these seldom make so good Plants as those obtained from Seeds; but the 2d Sort seldom produces any good Seeds, therefore that must be propagated in this Manner, or by planting Cuttings in the Spring or Summer Months, which will take Root, and make good Plants.

The 2d Sort grows naturally near the Sea, in several Parts of England. I have observed it upon the Sussex Coast in great Plenty, from whence I brought the Plants, which were of no longer Duration in the Garden than 2 Years, though in their native Soil they may continue longer. The Stalks of this, branch out pretty much, and spread near the Ground; they are garnished with dark green Leaves, composed of many double Wings, or Pinnae, like those of the common Chamomile, but are much thicker in Substance; they have their Edges turned backward so are convex on their upper Surface, and concave on their under. The Flowers are white, like those of the common Chamomile, and are disposed almost in the Form of an Umbel; they appear in July, and the Seeds ripen in Autumn.

This Plant is seldom cultivated but in Botanic Gardens for Variety. It may be propagated by Seeds, which

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may be sown either in Autumn, soon after they are ripe, or in the Spring, upon a Bed of common Earth in almost any Situation; and when the Plants come up, they will require no other Care, but to thin them where they are too close, and keep them clean from Weeds.

MATTED ROOTS are such as are entangled or plated together.

MAUDLIN. See Achillea.

MAUROCENIA. Lin. Gen. Plant. Edit. 2. 289. *Frangula* Hort. Elth. 121. The Hottentot Cherry, vulg.

The Characters are,

The Empalement of the Flower is of one Leaf, cut into 5 Segments, and is permanent. The Flower hath 5 oval Petals, which spread open. It hath 5 Stamina, which are situated between the Petals, crowned by obtuse Summits. In the Center is situated a roundish Germen, having no Style, crowned by a trifid Stigma. The Germen turns to an oval Berry, with one or two Cells, each containing one oval Seed.

The Species are,

1. MAUROCENIA *foliis subovatis integerrimis, floribus confertis lateralibus*. *Maurocenia* with entire Leaves, which are almost oval, and Flowers growing in Clusters on the Sides of the Branches. This is the *Frangula sempervirens, folio rigido subrotundo*. Hort. Elth. 146. Tab. 121. Ever-green Berry-bearing Alder with a roundish stiff Leaf, commonly called Hottentot Cherry.

2. MAUROCENIA *foliis obversè ovatis serratis floribus corymbosis alaribus & terminalibus*. *Maurocenia* with obverse, oval, sawed Leaves, and Flowers growing in a Corymbus at the Sides and Ends of the Branches. This is the *Phillyrea Capensis, folio celestri*. Hort. Elth. 315. Tab. 236. *Phillyrea* of the Cape with a Staff Tree Leaf, by the Dutch called Leplehout.

3. MAUROCENIA *foliis ovatis nervosis integerrimis*. *Maurocenia* with oval veined Leaves which are entire. This is the *Cerasus Hottentotorum*. Pluk. Almag. 94. The smaller Hottentot Cherry.

4. MAUROCENIA *foliis obversè ovatis emarginatis, floribus solitariis alaribus*. *Maurocenia* with obverse oval Leaves, which are indented at the Edges, and Flowers growing singly from the Sides of the Branches. This is the *Frangula folio subrotundo rigido subtus ferrugineo*. Houtt. Mss. Berry-bearing Alder with a roundish stiff Leaf, which is of an Iron Colour on the under Side.

The 1st Sort grows naturally at the Cape of Good Hope, where it rises to a considerable Height, but here they are rarely more than 5 or 6 Feet. The Stalk is strong, woody and covered with a purplish Bark, sending out many stiff Branches garnished with very thick Leaves, almost oval, standing for the most Part by Pairs, opposite; they are about 2 Inches long, and almost as much in Breadth, of a dark green Colour and entire. The Flowers come out from the Side of the old Branches, in Clusters, 3, 4, or 5, standing upon one common Foot Stalk, which is slender; they are composed of 5 plain equal Petals, ending in acute Points; they are first of a greenish yellow Colour, but afterward change to white, spreading wide open. In the Center is situated the oval Germen, crowned by the trifid Stigma, and between each Petal is situated a Stamina; these spread open in the same Manner as the Petals, and are terminated by obtuse Summits. The Germen turns to an oval pulpy Berry, some having but

but one, and others two Cells; in each of these is lodged one oval Seed. The Berries change to a dark purple when they are ripe. This Plant flowers in *July* and *August*, and the Berries ripen in Winter.

The 2d Sort is a Native of the *Cape of Good Hope*; this hath a woody Stalk, which in this Country seldom rises more than 5 or 6 Feet high, sending out many Branches, covered with a dark purplish Bark, and garnished with pretty stiff Leaves, obversely oval, and sawed on their Edges, standing by Pairs, opposite; they are about an Inch and a half long, and a little more in Breadth; of a light green, having short Foot Stalks. The Flowers are produced in roundish Bunches from the Side, and at the End of the Branches; they are white, and have 5 small Petals, which spread open; between these are situated the Stamina, which spread in the same Manner; these are terminated by obtuse Summits. In the Center is situated the roundish Germen, which is crowned sometimes by a bifid, and at others by a trifid Stigma. The Flowers appear in *July* and *August*, but are not succeeded by Berries in *England*.

The 3d Sort grows naturally at the *Cape of Good Hope*; this rises with a woody Stalk, about the same Height as the former, dividing into many Branches, garnished with stiff oval Leaves, about an Inch and a Quarter long, and nearly as much in Breadth, of a light green Colour, and entire, having 3 longitudinal Veins; these are sometimes placed by Pairs, opposite; and at others, they are alternate, having a strong Margin, or Border, surrounding them. As this Sort hath not as yet produced Flowers in *England*, I cannot give any Description of them; but I am fully informed from the *Cape*, that the Characters are the same with the others.

The 4th Sort was discovered by the late Dr. *Houffton*, growing naturally at the Palisadoes in *Jamaica*, from whence he sent the Seeds to *Europe*; this rises with a woody Stalk, from 15 to 20 Feet high, covered with a rough brown Bark, and divides into many Branches, garnished with stiff Leaves, placed alternately; they are about an Inch and a Half long, and a little more in Breadth, indented at the Top, with a stiff reflexed Border, of a gray Colour on their upper Side, but of a rusty Iron Colour on their under, standing upon short Foot Stalks. The Flowers come out singly along the Side of the Branches; they have 5 small white Petals, which end in acute Points, and 5 slender Stamina, which spread open, and are terminated by obtuse Summits. In the Center is situated a roundish Germen, supporting a long bifid Stigma, which is permanent. The Germen turns to a round Berry, with one or two Cells, each having one oblong Seed.

The 1st Sort is too tender to live abroad in *England*, but as it requires no artificial Heat, may be preserved through the Winter in a good Green-house, where it deserves a Place for the Beauty of its Leaves, which are very thick, of a deep green, and differing in Appearance from every other Plant; this may be propagated by laying down those Shoots which are produced near the Root, but they are long in putting out Roots. The Shoots should be twisted in the Part which is laid, to facilitate their putting out Roots; if these are laid down in Autumn, they will put out Roots sufficient to remove by the following Autumn; it may also be propagated by Cuttings, but this is a tedious Method, as they are seldom

rooted enough to transplant in less than 2 Years. When this is practised, the young Shoots of the former Year should be cut off, with a small Piece of the old Wood at the Bottom, in the Spring, and planted in Pots filled with loamy Earth, and plunged into a moderate hot Bed, covering the Pots with Glasses, which should be close stopped down to exclude the external Air; they should be pretty well watered at the Time they are planted, but afterward they will require but little Wet; the Glasses over them should be covered every Day with Mats, to screen the Cuttings from the Sun during the Heat of the Day, but in the Morning before the Sun is too warm, and in the Afternoon, when the Sun is low, they should be uncovered, that the oblique Rays of the Sun may raise a gentle Warmth under the Glasses. With this Care the Cuttings will take Root, but where it is wanting, they seldom succeed. When the Cuttings, or Layers, are rooted, they should be each planted in a small Pot, filled with soft loamy Soil, and placed in the Shade till they have taken new Root; then they may be removed to a sheltered Situation, where they may remain during the Summer Season; and, before the Frosts of the Autumn, they must be removed into the Green-house, and treated as other Plants of that Country, giving them but little Water in cold Weather, and in mild Weather admitting the free Air. In Summer they must be removed into the open Air, and placed in a sheltered Situation with other exotick Plants; in very warm Weather, they must be watered 3 Times a Week, but it must not be given them too freely at any Time. When the Plants have obtained Strength, they will produce Flowers and Fruit, which in warm Seasons will ripen perfectly, and if the Seeds are sown soon after they are ripe, in Pots, and plunged into the Tan Bed in the Stove, the Plants will come up the Spring following, and may then be treated in the same Manner, as those which are propagated by Cuttings and Layers.

The 2d Sort is not quite so hardy as the 1st, so must have a warmer Place in the Green-house in Winter, and should not be placed abroad so early, in the Spring, nor suffered to remain abroad so late in the Autumn, but if the Green-house is warm, the Plants will require no additional Heat. This may be propagated by Layers, and Cuttings as the first, and requires the same Care, for the Cuttings are with Difficulty made to root; nor will the Branches which are laid, put out Roots in less than a Year, and if these are not young Shoots, they will not take Root. As this Sort does not produce Seeds in *England*, it can be only propagated by Layers and Cuttings, which being difficult to root, occasions its scarcity in *Europe*.

The 3d Sort is yet more rare than either of the former, and is with greater Difficulty propagated, for the Layings and Cuttings are commonly 2 Years before they get Roots sufficient to remove, and as it never produces Seeds here, it can be no other Way propagated; this is also tenderer than either of the other Sorts, so requires a moderate Degree of Heat in Winter, for without some artificial Warmth, it will not live through the Winters in *England*. In the Middle of Summer the Plants may be placed abroad in a warm Situation, but they must be removed into Shelter early in the Autumn, before the cold Nights come on, otherwise they will receive a Check, which they will not recover in Winter; during the Summer

Summer Season they should be gently watered 3 Times a Week in dry Weather, but in Winter they will require but little Water.

The 4th Sort is much more impatient of Cold than either of the other, being a Native of a warmer Country. This is propagated by Seeds, which must be procured from the Country where it grows naturally, for it does not produce any here. These do not grow the first Year, so the Seeds should be sown in Pots filled with light Earth, and plunged into a moderate hot Bed of Tanners Bark, where they may remain all the Summer; and in Autumn they should be removed into the Bark Stove, and plunged into the Tan Bed; there they may remain till Spring, when they should be taken out of the Stove, and plunged into a fresh hot Bed, which will bring up the Plants. When these are fit to remove, they should be each transplanted into a separate small Pot, filled with a soft loamy Earth, and plunged into a hot Bed again, being careful to shade them from the Sun, till they have taken new Root, after which they must be treated as other tender Plants from the same Country, always keeping them in the Tan Bed; and in Winter they must have a temperate Warmth, otherwise they will not live here.

All the Sorts delight in a soft, gentle, loamy Soil, not over stiff, so as to detain the Wet; nor should the Soil be too light, for in such they will not thrive. They retain their Leaves all the Year, so make a good Appearance in the Winter Season, their Leaves being remarkably stiff and of a fine green, especially the first Sort, whose Fruit ripens in Winter, which when it is in Plenty on the Plants, affords an agreeable Variety.

MAYS. See Zea.

MEADIA. *Catesb. Dodecatheon. Lin. Gen. Pl. 1 3.*

The Characters are,

It hath a small Involucrum of many Leaves, in which are many Flowers. The Flower hath a permanent Empalement of one Leaf, cut into 5 long reflexed Segments. The Flower hath one Petal, cut into 5 Parts, whose Tube is shorter than the Empalement, and the Limb is reflexed backward. It hath 5 short obtuse Stamina fitting in the Tube, terminated by Arrow-pointed Stigmas, connected into a Beak, with a conical Germen supporting a slender Style longer than the Stamina, crowned by an obtuse Stigma. The Empalement becomes an oblong oval Capsule with one Cell, opening at the Top, and filled with small Seeds.

The Title of this Genus was given to it by Mr. Mark Catesby, F. R. S. in Honour of the late Dr. Mead; who was a generous Encourager of every useful Branch of Science; but being no great Botanist, Dr. Linnæus was unwilling any Plant should bear his Name, so he has altered it to that of *Dodecatheon*, which was a Title applied by Pliny to a Species of Primrose with a yellow Root, and Leaves like the Garden Lettuce.

We have but one Species of this Genus, viz.

MEADIA. *Catesb. Hist. Carol. App. 1. Tab. 11.* This is the *Auricula urvi Virginiana*, *floribus boraginis instar refractis*, *cyclaminum more reflexis*. Pluk. Alm. Bear's ear of Virginia, whose Flower has a Beak like that of Borage, and reflexed like those of Sowbread.

This Plant grows naturally in Virginia, and other Parts of North America, from whence it was sent by Mr. Banister, many Years since Gardener to Dr. Comp-

ton, Lord Bishop of London, in whose curious Garden I first saw this Plant growing in the Year 1709, after which the Plant was for several Years lost in England, till within a few Years past, when it was again obtained from America, and has been propagated in Plenty. It hath a perennial Root, from which comes out several long smooth Leaves in the Spring, which are near six Inches long, and two and a Half broad; at first standing erect, but afterward they spread on the Ground, especially if the Plants are much exposed to the Sun; from between these Leaves arise 2, 3, or 4 Stalks, in Proportion to the Strength of the Roots; these rise 8 or 9 Inches high, they are smooth, naked, and terminated by an Umbel of Flowers, under which is situated the many leaved Involucrum. Each Flower is sustained by a pretty long slender Foot Stalk which is recurved, so that the Flower hangs downward. The Flower has but one Petal, which is deeply cut into 5 Spear-shaped Segments, which are reflexed upward like the Flowers of Cyclamen or Sowbread; the Stamina, which are 5 in Number, are short, and sit in the Tube of the Flower, having 5 Arrow-pointed Summits, which are connected together round the Style, forming a Sort of Beak. The Flowers are purple, inclining to a Peach Blossom Colour, and have an oblong Germen situated in the Bottom of the Tube, which afterward becomes an oval Capsule inclosed by the Empalement, with the permanent Style on its Apex, which, when ripe, opens at the Top to let out the Seeds, which are fastened round the Style. This Plant flowers the Beginning of May, and the Seeds ripen in July, soon after which the Stalks and Leaves decay, so that the Roots remain inactive till the following Spring.

This Plant is propagated by Offsets, which the Roots put out freely when they are in a loose moist Soil and a shady Situation; the best Time to remove the Roots, and take away the Offsets, is in August, after the Leaves and Stalks are decayed, that they may be fixed well in their new Situation, before the Frost comes on. It may also be propagated by Seeds, which the Plants generally produce in Plenty; these should be sown in Autumn soon after they are ripe, in a shady moist Border, or in Pots which should be placed in the Shade; in Spring the Plants will come up, and must then be kept clean from Weeds, and if the Season proves dry, they must be frequently refreshed with Water; nor should they be exposed to the Sun, for while the Plants are young, they are very impatient of Heat, so that I have known great Numbers of them destroyed in 2 or 3 Days, which were growing to the full Sun. These young Plants should not be transplanted till their Leaves are decayed, then they may be carefully taken up and planted in a shady Border, where the Soil is loose and moist, at about 8 Inches Distance from each other, which will be Room enough for them to grow one Year, by which Time they will be strong enough to produce Flowers, so may then be transplanted into shady Borders in the Flower Garden, where they are very ornamental during the Continuance of their Flowers.

At the first many supposed this Plant to be tender, so planted it in warm Situations and nursed it too much, whereby the Plants were often killed, but by Experience it is found to be so hardy, as not to be hurt by the severest Cold of this Country; but it will not thrive

in a very dry Soil, or where greatly exposed to the Sun.

MEADOW.

Under the general Title of Meadow, is commonly comprehended all Pasture Land, or at least all Grass Land, which is mown for Hay; but I choose rather to distinguish such Land only by this Appellation, which is so low, as to be too moist for Cattle to graze upon in Winter, being generally too wet to admit heavy Cattle, without poaching and spoiling the Sward; and those Grass Lands which are drier, I shall distinguish by the Title of Pasture.

There are two Sorts of Meadows in *England*, one of which is stiled Water Meadows, and the other are simply called Meadows.

Water Meadows are those which lie contiguous to Rivers or Brooks, from whence the Water can be conveyed to overflow the Grass at Pleasure. Of these there are large Tracts in several Parts of *England*, which, if skilfully managed, would become much more profitable to their Owners, than they are at present, as hath been already mentioned in another Place; for nothing can be more absurd than the common Practice of flowing these low Grounds all the Winter, whereby the Roots of all the sweetest Kinds of Grass are destroyed, and only such Grasses left as are Natives of Marshes, which are coarse and sour: If People were curious to examine the Herbage of these Water Meadows, they would find them composed of bad Weeds, such as grow by the Sides of Rivers, Brooks, and Ditches, of which the several Sorts of Docks make no small Share; and although many of these Meadows produce a great Burden of what the Country People call Hay, yet this is only fit for Cows, Cart Horses, and other Animals, which, by hard Labour and Hunger, are driven to eat it; for Horses which have been accustomed to feed on good Hay, will starve before they will touch it: And after the Grass is mown off these Meadows, and Cattle turned in to graze upon them, how common is it to see the Land almost covered with these rank Weeds, which the Cattle never will eat! this must always be the Condition of Meadows, where Water is let over them in Autumn and Winter; for, as the Sides of Rivers and Brooks every where abound with rank Weeds, whose Seeds ripen in Autumn; they falling into the Water, are carried by the Stream, and deposited on the flowed Land, where they grow and fill the Ground in every Part; but so incurious are the Generality of Farmers in this Respect, that if the Ground is but well covered, they care not with what, few of them taking any Pains to weed or clean their Pastures.

The Method I proposed for these Meadows is, never to flow them till the Middle or latter End of *March*, excepting once or twice in Winter, when there may happen Floods, which may bring down a great Share of Soil from the upper Lands, at which Times it will be of great Service to let Water upon the Meadows, that the Soil may settle there; but the sooner the Wet is drained off when this is lodged, the greater Advantage the Meadows will receive by it; but from the End of *March* to the Middle of *May*, by frequently letting on the Water, the Growth of the Grass will be greatly encouraged, and at this Season there will be no Danger of destroying the Roots of the Grass; after the Hay is car-

ried off the Ground, if the Season should prove dry, it will be of great Service to the Grass, if the Meadows are flowed again; but when this is practised, no Cattle should be turned into the Meadows, till the Surface of the Ground is become firm enough to bear their Weight without poaching the Land, otherwise the Grass will suffer more from the treading of the Cattle, than it will receive Benefit by the flowing; but these are Things which the Country People seldom regard, so these Meadows are generally very unsightly, and rendered less profitable.

I would also recommend the weeding these Meadows twice a Year; first in *April*, and again in *October*; at which Times if they Roots of Docks, and all bad Weeds are cut up with a Spaddle, the Meadows will soon be cleared of this Trumpery, and the Herbage greatly improved.

Another great Improvement of these Lands might be procured by rolling them with a heavy Roller, in Spring and Autumn. This will press the Surface even, whereby it may be mown much closer, and it will also sweeten the Grass; and this Piece of Husbandry is of more Service to Pastures, than most People are aware of.

As to those Meadows which cannot be flowed, there should be the same Care taken to weed and roll them, as directed for the Water Meadows; as also never to let heavy Cattle graze upon them in Winter when they are wet; for the Cattle will then poach them, and greatly injure the Grass; therefore these should be fed down as close as possible in Autumn, before the heavy Rains fall to render the Ground soft; and those Pastures which are drier, may be kept to supply the Want of these in Winter; where there are not Cattle enough to eat down the Grass in Time, it will be much better to cut off what is left, than to suffer it to rot upon the Ground, for that will prevent the Grass from shooting early in the Spring; but where People have not Cattle enough of their own to eat down the Grass in Time, they had much better take in some of their Neighbours, than suffer their Fog (as it is called) to remain all the Winter. When these Meadows are fed in Autumn, the greater Variety of Animals are turned in, the closer they will eat the Grass; and I am fully convinced, the closer it is eaten, the better the Grass will come up the following Spring; therefore, if during the Time while the Cattle are feeding, the Meadows are well rolled, the Animals will eat the Grass much closer, than they otherwise would.

Those Persons who are best skilled in this Part of Husbandry, always dress their Meadows every other, or at least every third Year, without which it is in vain to expect a good Crop of Hay; but the Generality of Farmers are so much distressed for Dressing to supply their Corn Land, as not to have any to spare for their Meadows, so they are content with what the Land will naturally produce, rather than take any Part of their Manure from their arable Ground; but this is a very imprudent Piece of Husbandry, for if Land is to be annually mowed for Hay, can it be supposed that it will produce a good Crop long, unless proper Dressings are allowed it? And when Ground is once beggared for Want of Manure, it will be some Years before it can be recovered again; but I shall reserve what is further necessary on this Subject, to be fully treated under the Article of *Pasture*.

MEADOW SAFFRON. See *Colchicum*.

MEDEOLA. *Lin. Gen. Plant.* 411.

The

The Characters are,

The Flower has no Empalement; it hath six oblong oval Petals which are equal, spread open, and turn backward; and six Awl-shaped Stamina the Length of the Petal, terminated by incumbent Summits; and 3 corniculated Germen terminating the Style, crowned by thick recurved Stigmas. The Germen afterward turns to a roundish trifid Berry with 3 Cells, each containing one Heart-shaped Seed.

The Species are,

1. MEDEOLA foliis ovato-lanceolatis alternis, caule scandente. Medeola with oval, Spear-shaped, alternate Leaves, and a climbing Stalk. This is the *Asparagus Africanus, scandens, myrti folio*. Hort. Piff. 17. Climbing African Asparagus, with a Myrtle Leaf.

2. MEDEOLA foliis lanceolatis alternis, caule scandente. Medeola with Spear-shaped alternate Leaves, and a climbing Stalk. This is the *Asparagus Africanus, scandens, myrti folio angustiore*. Hort. Piff. 17. Climbing African Asparagus, with a narrow Myrtle Leaf.

3. MEDEOLA foliis verticillatis, ramis aculeatis. Lin. Sp. Plant. 339. Medeola with Leaves growing in Whorls and prickly Branches. This is the *Fruticulus foliis rufci stellatis*. Hort. Elth. 148. Tab. 123. A small Shrub with Butchers Broom Leaves placed Star Fashion.

4. MEDEOLA foliis verticillatis, ramis inermibus. Lin. Sp. Pl. 339. Medeola with Leaves growing in Whorls and smooth Branches. This is the *Lilium frve martagon pusillum, floribus minutissimis herbaceis*. Pluk. Alm. 401. Lily or little Martagon, with Flowers not very herbaceous.

The 1st Sort grows naturally at the Cape of Good Hope; this hath a tuberoso Root, composed of several Dugs or oblong Knobs, which unite together at the Top, from which arise 2 or 3 stiff Stalks, which divide into a great Number of Branches, rising 4 or 5 Feet high, if they meet with any neighbouring Support, to which they can fasten, otherwise they fall to the Ground; these are garnished with oval Spear-shaped Leaves, ending in acute Points, placed alternately, and sitting close to the Stalks; they are of a light green on their under Side, and dark on their upper. The Flowers come out from the Side of the Stalks, sometimes singly, and at others there are 2 upon a slender short Foot Stalk; they have 6 oblong equal Petals which spread open, of a dull white Colour; within these are ranged 6 Stamina, as long as the Petals, terminated by incumbent Summits. In the Center is situated a Germen with 3 Horns, sitting on a short Style, and crowned by 3 thick recurved Stigmas; the Germen turns to a roundish Berry with 3 Cells, each containing one Heart-shaped Seed. It flowers the Beginning of Winter, and the Seeds are ripe in Spring.

The 2d Sort is also a Native of the Cape of Good Hope, from whence I received the Seeds. This hath a Root like the 1st, but the Stalks are not so strong; they climb higher, but do not branch so much; the Leaves are much longer, narrower, and of a grayish Colour. The Flowers come from the Side of the Branches, 2 or 3 on each Foot Stalk; they are of an herbaceous white Colour, shaped like the former Sort, and appear about the same Time, but this has not produced any Fruit here. These are undoubtedly distinct Species, for they never vary when raised from Seeds.

Both these Sorts propagate freely by Offsets from the Roots, so that when they are once obtained, there will be no Necessity of sowing their Seeds, which commonly lie a Year in the Ground, and the Plants will not be strong enough to flower in less than 2 Years more, whereas the Offsets will flower the following Season. The Time for transplanting and parting the Roots is in July, when their Stalks are entirely decayed, for they begin to shoot toward the End of August, keep growing all the Winter, and decay in Spring. These Roots should be planted in Pots filled with good Kitchen Garden Earth, and may remain in the open Air till there is Danger of Frost, when they must be removed into Shelter, for they are too tender to live through the Winter in the open Air; but if placed in a warm Green-house, they will thrive and flower very well, but they do not produce Fruit unless they have some Heat in Winter; therefore where that is desired, the Plants should be placed in a Stove kept to a moderate Degree of Warmth. During Winter, when the Plants are in Vigour, they should be frequently, but gently watered; but when the Stalks begin to decay, they must have very little Wet, for much Moisture will rot them while in an inactive State; during which Time, if the Pots are placed where they have only the Morning Sun, they will require no Water; but when they begin to shoot out their Stalks, they should be removed to a warmer Situation, and should then be gently watered.

The Flowers of these Plants make no great Appearance, so the Plants are not preserved for their Beauty; but as the Stalks are climbing, and their Leaves in full Vigour in Winter, during that Season, they add to the Variety in the Green-house.

The 3d Sort grows naturally in the West-Indies, the late Dr. Housloun found it near the Havannab, and Mr. Robert Millar gathered it in the Isle of Tobago, where it was growing in Plenty. This is a very low Shrub, seldom rising more than 3 Feet high in its native Soil; the Stalks are herbaceous like those of Butchers Broom, and divide upward into several Branches garnished with stiff Leaves, ending in acute Spines; they are like those of the Butchers Broom, but are longer and narrower; these stand in Whorls round the Stalks, there are 9, 11, or more, at each Joint. The Flowers are produced just under the Leaves, sometimes singly, at others there are two, which come out from the same Joint; they are of an herbaceous white Colour, having six oblong pointed Petals, with six Stamina not so long as the Petals, and a roundish Germen which afterward turns to an oval Berry with three Cells, each having one Heart shaped Seed.

This Plant is tender, so will not thrive in this Country, unless placed in a Bark Stove. It is propagated by Seeds, which should be sown in Pots and plunged into a Bark Bed, where they may remain all the Summer, for the Plants seldom come up the first Year; in Autumn they should be removed into the Bark Stove, to remain till the following Spring, when they should be removed into a fresh hot Bed, which will bring up the Plants; but as these are very slow in their Growth, so they will not be fit to transplant till the following Spring, when they may be each planted in a separate Pot filled with light sandy Earth, and plunged into a

fresh hot Bed, shading them from the Sun till they are new rooted, after which they must be treated as other tender Plants from the same Country.

The Plants raised from the Seeds here, did not rise above a Foot high in five Years, so slow were they in Growth, though they always appeared healthy.

The 4th Sort is a Native of *North America*; it is by Dr. *Linnaeus* joined to this Genus, in which I have followed him; though, if I remember rightly, the Characters do not exactly agree with the other, for the Flower is either polypetalous, or is cut into many Segments, and has but 5 Stamina; it being some Years since I saw the Flowers, I cannot be very certain if I am right. This hath a small scaly Root, from which arises a single Stalk about 8 Inches high, garnished with one Whorl of Leaves at a small Distance from the Ground, and at the Top there are 2 Leaves standing opposite; between these come out 3 slender Foot Stalks which turn downward, each sustaining one pale herbaceous Flower, with a purple Pointal. It flowers in June, but I have not seen any Fruit upon it.

This Plant is hardy enough to live in the open Air, but does not propagate fast here, as it produces no Seeds, so can only be increased by Offsets.

MEDICA. *Tourn. Inst. R. H.* 410. *Tab.* 231. *Medicago. Tourn. Inst.* 412. *Lin. Gen. Plant.* 805. Medick, or La Lucerne.

The Characters are;

The Flower hath a Bell-shaped Empalement of one Leaf, cut into 5 equal acute Points. The Flower is of the Butterfly Kind; the Standard is oval, entire, and the Border reflexed; the two Wings are oblong, oval, and fixed by an Appendix to the Keel; the Keel is oblong, bifid, obtuse, and reflexed toward the Standard. It has 10 Stamina, 9 of which are joined almost to their Tops; the other is single, they are terminated by small Summits. It hath an oblong compressed Germen which is incurved, sitting on a short Style, and terminated by a small Stigma; this and the Stamina, are involved by the Keel and Standard. The Germen turns to a compressed Moon-shaped Pod, inclosing several Kidney-shaped Seeds.

The Species are,

1. MEDICA major, erectior, floribus purpurascens. *J. B.* 2. 382. Greater upright Medick with purplish Flowers, commonly called La Lucerne, and by the French, Burgundy Hay.

2. MEDICA sylvestris, floribus croceis. *J. B.* 2. 383. Wild Medick with Saffron-coloured Flowers.

3. MEDICA caule herbaceo procumbente, foliis ternatis, leguminibus ciliato-dentatis. Medick with an herbaceous trailing Stalk, trifoliate Leaves, and Pods which have hairy indentures. *Medicago annua, trifolii facie, Tourn. Inst.* Annual Medicago with the Appearance of Trefoil.

4. MEDICA caule herbaceo procumbente, foliis pinnatis, leguminibus ciliato-dentatis. Medick with a trailing herbaceous Stalk, winged Leaves, and Pods having hairy indentures. *Medicago vulnerariae facie Hispanica. Tourn.* Spanish Medicago with the Appearance of Ladies Finger.

5. MEDICA caule herbaceo prostrato, foliis ternatis, foliolis cuneiformibus superne serratis, leguminibus margine integerrimis. Medick with a prostrate herbaceous Stalk, trifoliate Leaves, whose Lobes are Wedge-shaped and sawed at the Top, and the Borders of the Pods entire. This is the *Medicago Italica, annua, maritima, trifolia, polycarpus, fructu toroso non spinoso. Mitchel. Hort. Piff.*

Annual Italian maritime *Medicago* with trifoliate Leaves, and bearing much Fruit, thick and without Spines.

6. MEDICA caule herbaceo prostrato, pedunculis racemosis, leguminibus lunatis. Medick with a prostrate herbaceous Stalk, branching Foot Stalks, and Moon-shaped Pods. This is the *Medica flavo flore. Clus. Hist.* 2. p. 243. Medick with a yellowish Flower.

7. MEDICA caule herbaceo prostrato, foliis radicalibus integerrimis, caulibus pinnatis, leguminibus dentatis. Medick with a prostrate herbaceous Stalk, the Bottom Leaves entire, those on the Stalks winged, and indented Pods. *Medicago vulnerariae facie Cretica. Tourn.* Cretan Medicago with the Appearance of Ladies Finger.

8. MEDICA foliis ternatis, foliolis cuneiformibus, caule erecto arboreo. Medick with trifoliate Leaves whose Lobes are Wedge-shaped, and an erect Tree-like Stalk. *Medicago trifolia, frutescens, incana. Tourn.* Shrubby, hoary, three leaved Medicago, or the *Cytisus Virgilii*.

The first Sort hath a perennial Root and an annual Stalk, which rises near 3 Feet high in good Land; these are garnished with trifoliate Leaves at each Joint, whose Lobes are Spear-shaped, about an Inch and a Half long, and half an Inch broad, sawed toward their Top, of a deep green, and placed alternately on the Stalks. The Flowers grow in Spikes, from 2 to near 3 Inches in Length, standing on naked Foot Stalks 2 Inches long, rising from the Wings of the Stalk; they are of the Pea Bloom or Butterfly Kind, of a fine purple Colour; these are succeeded by compressed Moon-shaped Pods, which contain several Kidney-shaped Seeds. It flowers in June, and the Seeds ripen in September.

There are the following Varieties of this Plant:

One with Violet-coloured Flowers.

Another with yellow Flowers.

A third with yellow and Violet Flowers mixed.

And a fourth with variegated Flowers.

These Variations of their Flowers have accidentally risen from Seed, therefore are not to be supposed different Plants; yet those with the yellow and variegated Flowers are never so strong as those with purple, so are less profitable to the Cultivators.

This Plant is supposed to have been brought originally from *Media*, and from thence had its Name *Medica*: It is by the Spaniards called *Alfafa*; by the French, *La Lucerne*, and *Grande Trefle*; and by several Botanick Writers *Fœnum Burgundiacum*, i. e. *Burgundian Hay*. There is little Room to doubt of this being the *Medica* of *Virgil*, *Columella*, *Palladius*, and other ancient Writers of Husbandry, who have not been wanting to extol the Goodness of this Fodder, and have given Direction for the Cultivation of it in those Countries where they lived.

But notwithstanding it was so much commended by the Ancients, and hath been cultivated to so good Purpose by our Neighbours in *France*, and *Switzerland* for many Years, it hath not as yet found so good Reception in our Country as could be wished, nor is it cultivated in any considerable Quantity; though it is evident, it will succeed as well in *England* as in either of the before-mentioned Countries, being extremely hardy, and resisting the severest Cold of our Climate: As a Proof of this, I must beg Leave to mention, that the Seeds which have happened to be scattered upon the Ground in Autumn, have come up, and the Plants have endured

ndured the Cold of a severe Winter, and made very strong Plants.

About the Year 1650, the Seeds of this Plant were brought over from *France*, and sown in *England*; but whether for want of Skill in its Culture, whereby it did not succeed, or that the People were so fond of going on in their old beaten Road, as not to try the Experiment, whether it would succeed here or not, was the Occasion of its being entirely neglected in *England*, I cannot say, but it is very certain that it was neglected many Years, so as to be almost forgotten. However I hope, before I quit this Article, to give such Directions for its Culture, as will encourage the People of *England* to make farther Trial of this valuable Plant, which grows in the greatest Heat, and also in very cold Countries, with this Difference only, that in very hot Countries, such as the *Spanish West-Indies*, &c. where it is the Chief Fodder for their Cattle, they cut it every Week, whereas in cold Countries it is seldom cut oftner than 3 or 4 Times a Year. And it is very likely, that this Plant will be of great Service to the Inhabitants of *Barbadoes*, *Jamaica*, and the other hot Islands in the *West Indies*, where one of the greatest Things they want is Fodder for their Cattle; since by the Account given of this Plant by *Pere Feuillée*, it thrives exceedingly in the *Spanish West-Indies*, particularly about *Lima*, where they cut it every Week, and sell it in the Market, being the only Fodder cultivated there.

It is also very common in *Languedoc*, *Provence*, *Dauphiné*, and all over the Banks of the *Rhone*, where it produces abundantly, and may be mowed 5 or 6 Times a Year. Horses, Mules, Oxen, and other domestick Cattle, love it exceedingly; but above all when it is green, if they are permitted to feed on it, and especially the black Cattle, which will feed very kindly upon the dried Plant; the Excess of which is, by many People, thought to be very dangerous; but it is said to be exceeding good for Milch Cattle, to promote their Quantity of Milk; and is also said to agree with Horses the best of all, though Sheep, Goats, and most other Cattle, will feed upon it, especially when young.

The Directions given by all those who have written of this Plant are very imperfect, and generally such as, if practised in this Country, will be found entirely wrong; for most of them order the mixing this Seed with Oats or Barley (as is practised for Clover;) but in this Way it seldom comes up well, and if it does, will draw up so weak by growing among the Corn, as not to be recovered under a whole Year, if ever it can be brought to its usual Strength again.

Others have directed it to be sown on a low rich moist Soil, which is found to be the worst next to a Clay, of any for this Plant; in both which the Roots will rot in Winter, and in a Year or two the whole Crop will be destroyed.

But the Soil in which this Plant is found to succeed best in this Country is, a light, dry, loose, sandy Land, which should be well ploughed and dressed, and the Roots of all noxious Weeds, such as Couch Grass, &c. destroyed, otherwise these will overgrow the Plants while young, and prevent their Progress.

The best Time to sow the Seed is about the Middle of April, when the Weather is settled and fair; for if

you sow it when the Ground is very wet, or in a rainy Season, the Seeds will burst and come to nothing (as is often the Case with several of the leguminous Plants); therefore you should always observe to sow it in a dry Season, and if there happens some Rain in about a Week or ten Days after it is sown, the Plants will soon appear above Ground.

But the Method I would direct for the sowing these Seeds, is as follows: After having well ploughed and harrowed the Land very fine, you should make a Drill quite across the Ground almost half an Inch deep, into which the Seeds should be scattered very thin, then cover them over a Quarter of an Inch thick, or somewhat more, with the Earth, then proceed to make another Drill about a Foot and a Half from the former, sowing the Seeds therein in the same Manner as before, and so proceed through the whole spot of the Ground, allowing the same Distance between Row and Row, and scatter the Seeds very thin in the Drills. In this Manner, an Acre of Land will require about 6 Pounds of Seeds; for when it is sown thicker, if the Seed grows well, the Plants will be so close as to spoil each other in a Year or two, the Heads of them growing to a considerable Size, as will also the Roots, provided they have Room. I have measured the Crown of one Root, which was in my Possession, 18 Inches Diameter; from which I cut near 400 Shoots at one Time, which is an extraordinary Increase, and this upon a poor dry gravelly Soil which had not been dunged for many Years, but the Roots was at least ten Years old; so that if this Crop, be well cultivated it will continue many Years, and be equally good as when it was first sown; for the Roots generally run down very deep in the Ground, provided the Soil be dry; and although they should meet a hard Gravel a Foot below the Surface, yet their Roots would penetrate it, and make their Way downward, as I have experienced, having taking up some of them, which were above a Yard in Length, and had run above 2 Feet into a Rock of Gravel, which was so hard as not to be loosened without Mattocks and Crows of Iron, and that with much Difficulty.

The Reason for directing this Seed to be sown in Rows is, that the Plants may have Room to grow; and for the better stirring the Ground between them, to destroy the Weeds, and encourage the Growth of the Plants, which may be very easily effected with a *Dutch Hoe*, just after cutting the Crop each Time, which will cause the Plants to shoot again in a very little Time, and be much stronger than in Places where the Ground cannot be stirred; but when the Plants first come up, the Ground between should be hoed with a common Hoe; and if in doing this you cut up the Plants where they are too thick, it will cause the remaining to be much stronger. This Hoeing should be repeated 2 or 3 Times while the Plants are young, according as the Weeds are produced, observing always to do it in dry Weather, that the Weeds may the better be destroyed; for if it be done in moist Weather, they will root and grow again.

With this Management, the Plants will grow to the Height of 2 Feet, or more, by the Beginning of *August*, when the Flowers will begin to appear, at which Time it should be cut, observing to do it in a dry Season, if it is to be made Hay, and keep it often turned, that it may soon

soon dry, and be carried off the Ground, for if it lie long upon the Roots, it will prevent the shooting again. After the Crop is taken off you should stir the Ground between the Rows with a Hoe, to kill the Weeds, and loosen the Surface, which will cause the Plants to shoot again in a short Time, so that by the Beginning of *September* there will be shoots 4 or 5 Inches high, when you may turn in Sheep upon it to feed it down, for it will not be fit to cut again the same Season, nor should the Shoots be suffered to remain upon the Plants, which would decay when the frosty Weather comes on, and fall down upon the Crown of the Roots, and prevent their shooting early the succeeding Spring.

So that the best Way is to feed it until *November*, when it will have done shooting for that Season; but it should not be fed by large Cattle the first Year, because the Roots, being young, would be in Danger of being destroyed, either by their trampling upon them, or their pulling them out of the Ground; but Sheep will be of Service to the Roots by dunging the Ground, provided they do not eat it too close, so as to endanger the Crown of the Roots.

The Beginning of *February*, the Ground between the Roots should be again stirred with the Hoe, to encourage them to shoot again, but in doing this you should be careful not to injure the Crown of the Roots, upon which the Buds are at that Time very turgid, and ready to push. With this Management, if the Soil be Warm, by the Middle of *March* the Shoots will be 5 or 6 Inches high, when, if you are in Want of Fodder, you may feed it down till a Week in *April*; after which it should be suffered to grow for a Crop, which will be fit to cut the Beginning of *June*, when you should observe to get it off the Ground as soon as possible, and stir the Ground again with a *Dutch Hoe*, which will forward the Plants shooting again, so that by the Middle, or latter End of *July*, there will be another Crop fit to cut, which must be managed as before; after which it should be fed down again in Autumn; and as the Roots by this Time will have taken deep Hold in the Ground, there will be little Danger of hurting them, if you should turn in larger Cattle; but you must always observe not to suffer them to remain after the Roots have done shooting, lest they should eat down the Crown of the Roots below the Buds which would considerably damage, if not destroy them.

In this Manner you may continue constantly to have 2 Crops to cut, and 2 Feedings from this Plant, and in good Seasons there may be 3 Crops cut, and 2 Feedings, which will be a great Improvement, especially as it will grow upon dry barren Soils, where grass will come to little, and be of great use in dry Summers when Grass is often burnt up. And as it is an early Plant in the Spring, so it will be of great Service when Fodder falls short at that Season, when it will be fit to feed at least a Month before Grass or Clover; for I have had this Plant 8 Inches high by the 10th of *March*, Old Style, at which Time the Grass in the same Place has scarcely been one Inch high.

That the Cold will not injure this Plant, I am fully satisfied, for in the very cold Winter 1728-9, I had some Roots of this Plant which were dug up in *October*, and laid upon the Ground in the open Air till the Begin-

ing of *March*, when I planted them again, and they shot out very vigorously soon after; nay, even while they lay on the Ground, they struck out Fibres from the under Side of the Roots, and had begun to shoot green from the Crown of the Roots. But that Wet will destroy the Roots, I am fully convinced, for I sowed a little of the Seed on a moist spot of Ground for a Trial, which came up very well, and flourished exceedingly during the Summer Season, but in Winter, when the great Rains fell, the Roots began to rot at Bottom, and before the Spring most of them were destroyed.

The best Places to procure the Seed from, are *Switzerland*, and the Northern Parts of *France*, which succeed better with us than that which comes from a more Southern Climate; but this Seed may be saved in *England* in great Plenty, in order to which a small Quantity of the Plants should be suffered to grow till the Seeds are ripe, when it must be cut, and laid to dry in an open Barn where the Air may freely pass through; but the Seed must be defended from the Wet, for if it be exposed thereto, it will shoot while it remains in the Pod, whereby it will be spoiled. When it is quite dry, it must be threshed out, cleansed from the Husk, and preserved in a dry Place till the Season for sowing; and the Seed saved in *England* is much preferable to any brought from Abroad, as I have several Times experienced, the Plants produced from it having been much stronger than those produced from *French*, *Helvetian*, and *Turkey* Seeds, sown at the same Time, and on the same Soil and Situation.

I am inclinable to think that the Reason of this Plant not succeeding, when it has been sown in *England*, has been occasioned by sowing it with Corn, with which it will by no Means thrive (for though the Plant be very hardy when grown pretty large, yet at its first coming up, if it be incommoded by any other Plants or Weeds, it seldom does well; therefore it should always be sown by itself, and carefully cleared from Weeds until it has Strength, after which it is not easily destroyed); or, perhaps, People have sown it at a wrong Season, or in wet Weather, whereby the Seeds have rotted, and never come up, which hath discouraged their attempting it again; but however the Success has been, I dare aver, that if the Method of sowing and managing this Plant, which is here laid down, be duly followed, it will be found to thrive as well as any other Sort of Fodder now cultivated in *England*, and will continue much longer, for if the Ground be duly stirred after the Cutting each Crop, and the last Crop fed, as hath been directed, the Plants will continue in Vigour 20 Years, or more, without renewing, provided they are not permitted to seed, which will weaken the Roots more than 4 Times cutting it would do.

The Hay of this Plant should be kept in close Barns, it being too tender to be kept in Riaks open to the Air as other Hay; but it will remain good, if well dried before it be carried in, three Years. The People Abroad reckon an Acre of this Fodder sufficient to keep three Horses all the Year round.

And I have been assured by Persons of undoubted Credit who have cultivated this Plant in *England*, that 3 Acres of it have fed 10 Cart Horses from the End of *April* to the Beginning of *October*, without any other Food

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Food, though they have been constantly worked. Indeed the best Use which can be made of this Grass is, to cut it, and give it green to the Cattle; where this hath been daily practised, I have observed that by the Time the Field has been cut over, that Part which was the first cut, hath been ready to cut again; so that there has been a constant Supply in the same Field, from the Middle of *April* to the End of *October*; when the Season has continued long mild, and when the Summers have proved showery, I have known 6 Crops cut in one Season; but in the driest Seasons there will be always three. When the Plant begins to flower, it should then be cut, for if it stands longer, the Stalks will grow hard, and the under Leaves decay, so that the Cattle will not greedily devour it. Where there is a Quantity of this cultivated, some of it should be cut before the Flowers appear, otherwise there will be too much to cut within a proper Time.

When this is made into Hay, it will require a great deal of making, for as the Stalks are very succulent, it must be often turned, and exposed a Fortnight before it will be fit to house, for this requires a longer Time to make than *Saint Foin*, therefore, when it is cut, it should be carried to make upon some Grass Ground, because the Earth in the Intervals of the Rows will wash up, and mix with the Hay in every Shower of Rain, and by carrying it off as soon as it is cut, the Plants will shoot up again soon; but it is not so profitable for Hay, as to cut green for all Sorts of Cattle, especially Horses, which are extremely fond of it, and to them it will answer the Purpose of both Hay and Corn, and they may be worked at the same Time just as much as when they are fed with Corn, or dry Food.

The 2d Sort grows naturally in the South of *France*, in *Spain* and *Italy*, and has been supposed only a Variety of the 1st, but I have frequently cultivated this by Seeds, and have never observed it alter. The Stalks of this are smaller, and never rise so high; the Leaves are not half so broad; the Flowers are produced in short roundish Spikes, and are of a Saffron Colour. This flowers about the same Time as the 1st, and the Seeds ripen the latter Part of Summer. It may be easily propagated by Seeds, and hath a perennial Root which will continue many Years; it is seldom cultivated any where.

The 3d Sort grows naturally in *Italy*: this is an annual Plant, having several slender branching Stalks a Foot and a Half long, which spread on the Ground, and are garnished with trifoliate Leaves, whose Lobes are oval, Spear-shaped, and entire. The Flowers are produced singly, upon the slender Foot Stalks, which proceed from the Side of the Branches; they are small, of a yellow Colour, and shaped like those of the former Sort; these are succeeded by broad, flat, Moon shaped Pods, whose Borders are indented, and these Indentures are terminated by fine Hairs; in each of these Pods, is lodged 4 or 5 Kidney-shaped Seeds. It flowers in *June* and *July*, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in *Spain*: this is also an annual Plant, whose Stalks grow a Foot and a Half long, trailing on the Ground; they are garnished with winged Leaves, composed of 2 Pair of small Lobes, terminated by one large, oval, Spear-shaped Lobe; they are a little hoary, and placed alternately at the Joints. The Flowers stand on long slender Foot Stalks, each sustain-

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ing 4 or 5 Gold-coloured Flowers at the Top; these are succeeded by compressed Moon-shaped Pods, not half so large as those of the 3d Sort, but have hairy Indentures like those. This flowers and perfects its Seeds about the same Time as the former.

The 5th Sort grows naturally on the Borders of the Sea in several Parts of *Italy*; this is also an annual Plant, with prostrate herbaceous Stalks, about a Foot long, garnished with trifoliate Leaves, whose Lobes are Wedge-shaped and sawed toward the Top. The Flowers are produced upon slender Foot Stalks arising from the Joints of the Stalk; they are about an Inch long, each sustaining 5 or 6 pale yellow Flowers, which are succeeded by small thick Moon-shaped Pods, whose Borders are entire, containing 3 or 4 small Kidney-shaped Seeds in each. It flowers and Seeds about the same Time with the two former.

The 6th Sort grows in most of the warm Countries in *Europe*; this is a biennial Plant, with a prostrate herbaceous Stalk about a Foot long, which branches out on every Side, and is garnished with trifoliate Leaves, whose Lobes are oval and entire. The Flowers stand on branching Foot Stalks, which come out toward the End of the Branches, each sustaining many pale yellow Flowers, which sit upon short separate Foot Stalks; these are succeeded by Moon-shaped Pods, each containing 4 or 5 Kidney-shaped Seeds.

The 7th Sort grows naturally in the *Archipelago*; this is an annual Plant, from whose Roots come out several oblong Leaves, about 2 Inches and a Half long, narrow at their Base, but broad toward the Top, where they are rounded; these spread on the Ground, and between them come out the Stalks which are slender, about a Foot long, branching out into smaller; they are garnished with winged hoary Leaves; those on the lower Part of the Stalk, are composed of 2 Pair of Lobes, terminated by an odd one; these are equal in Size, but those on the upper Part of the Stalks are trifoliate. The Flowers are produced at the End of the Stalks, they are small, yellow, and shaped like those of the other Sorts, and are succeeded by compressed Moon-shaped Pods which are acutely indented on their Borders, and contain 3 or 4 Kidney-shaped Seeds. This Plant flowers and ripens its Seeds about the same Time as the other.

These annual Sorts are preserved in the Gardens of those who are curious in Botany; the Seeds of these should be sown on an open Bed of fresh Ground, in the Place where the Plants are to remain, because they do not bear transplanting well, unless when they are young. As the Plants spread their Branches on the Ground, so they should not be sown nearer than 2 Feet and a Half asunder; when they come up, they will require no Care but to keep them clean from Weeds. In *June* they will begin to flower, and as the Stalks and Branches extend, there will be a Succession of Flowers produced till the Autumn; the early Flowers will be succeeded by good Seeds, but those which come late in Summer, have not Time to ripen before the cold Weather comes on.

The 8th Sort grows naturally in the Islands of the *Archipelago*, in *Sicily*, and the warmest Parts of *Italy*. This rises with a shrubby Stalk to the Height of 6 or 7 Feet, covered with a grayish Bark, and divides into many Branches, which, while young, are covered with a hoary

a hoary Down; these are garnished at each Joint with trifoliate Leaves, standing on Foot Stalks about an Inch long; there are 2 or 3 of these at each Joint, so that the Branches are closely covered with them; the Lobes are small, Spear-shaped, and hoary on their under Side; these remain all the Year. The Flowers are produced on Foot Stalks which arise from the Side of the Branches, they are of a bright yellow, each Foot Stalk sustaining 4 or 5 Flowers; these are succeeded by compressed Moon-shaped Pods, each containing 3 or 4 Kidney-shaped Seeds.

It flowers great part of the Year, and when the Winters are favourable all the Year, or when the Plants are sheltered in Winter, they are seldom destitute of Flowers; but those in the open Air begin to flower in *April*, and continue in Succession till *December*. Those Flowers which appear early in Summer, will have their Seeds ripe in *August*, or the Beginning of *September*, and the others will ripen in Succession till the Cold stops them.

This Plant may be propagated by sowing the Seeds, either upon a moderate hot Bed, or a warm Border of light Earth, in the Beginning of *April*, and when the Plants come up, they should be carefully cleared from Weeds; they should remain undisturbed, if sown in the common Ground, till *September* following, but if on a hot Bed, they should be transplanted about *Midsummer* into Pots, placing them in the Shade until they have taken Root; after which they may be removed into a Situation where they may be screened from strong Winds, in which they may abide till the latter end of *October*, when they must be put into a Frame, in order to shelter them from hard Frosts, for those Plants which have been brought up tenderly, will be liable to suffer by hard Frosts, especially while they are young. In *April* following these Plants may be shaken out of the Pots, and placed in the full Ground where they are designed to remain, which should be in a light Soil, and warm Situation, in which they will endure the Cold of our ordinary Winters extremely well, and produce Flowers most Part of the Year, and retaining their Leaves all the Winter renders them valuable.

Those also which were sown in an open Border may be transplanted in *August* following, in the same Manner; in doing this, you must be careful to take them up with a Ball of Earth to their Roots, if possible, as also to water and shade them until they have taken Root; after which they will require little more Care than to keep them clear from Weeds, and to prune off the luxuriant Branches to keep them in due Compass; but never prune them early in Spring, nor late in Autumn, for if Frost should happen soon after they are pruned, it will destroy the tender Branches, and, many Times the whole Plant is lost thereby.

These Plants have been constantly preserved in the Green-house, supposing them very tender; but I have had large Plants of this Kind, which have remained in the open Air in a warm Situation many Years without any Cover, and have been much stronger, and flowered better, than those which were housed, though, indeed, it will be proper to keep a Plant or two in Shelter, lest by a very severe Winter (which sometimes happens in *England*) the Plants abroad should be destroyed.

They may also be propagated by Cuttings, which should be planted in *April*, on a Bed of light Earth, and watered and shaded until they have taken Root, after

which they may be exposed to the open Air, but they should remain in the same Bed till *August* following before they are transplanted, by which Time they will have made strong Roots, and may be removed then with Safety to the Places where they are to remain, observing (as before directed) to water and Shade them until they have taken Root; after which you may train them up with strait Stems, by fastening them to Sticks, otherwise they are apt to grow crooked and irregular, and when you have got their Stems to the Height you design them, they may then be reduced to regular Heads, and with pruning their irregular Shoots every Year, they may be kept in very good Order.

This Plant grows in great Plenty in the Kingdom of *Naples*, where the Goats feed upon it, with whose Milk the Inhabitants make great Quantities of Cheese; it also grows in the Islands of the *Archipelago*, where the *Turks* use the Wood of these Shrubs to make Handles for their Sabres, and the *Calogers* of *Patmos* make their Beds of this Wood.

This is, as hath been before observed, by many People supposed to be the *Cytisus* of *Virgil*, *Columella*, and the old Writers in Husbandry, which they mention as an extraordinary Plant, and worthy of Cultivation for Fodder, from whence several Persons have recommended it as worthy of our Care in *England*. But however useful this Plant may be in *Crete*, *Sicily*, *Naples*, or those warmer Countries, yet I am persuaded it will never thrive in *England*, so as to be of any real Advantage for that Purpose, for in severe Frost it is very subject to be destroyed, or at least so much damaged, as not to recover its former Verdure before the Middle, or latter End of *May*, and the Shoots which are produced, will not bear cutting above once in a Summer, and then will not be of any considerable Length, and the Stems growing very woody, will render the cutting of it very troublesome; so that, upon the Whole, it can never answer the Trouble and Expence of cultivation, nor is it worth the Trial, since we have so many other Plants preferable to it; though in hot, dry, rocky Countries, where few other Plants will thrive, this may be cultivated to great Advantage, since in such Situations it will live many Years, and thrive very well.

But however unfit this may be for such Uses in *England*, yet for the beauty of its hoary Leaves, which abide all the Year, together with its long Continuance in flower, it deserves a Place in every good Garden, where being intermixed with Shrubs of the same Growth, it makes a very agreeable Variety.

MEDICAGO. *Lin. Gen. Plant.* 805. *Medic. Tourn.* *Inst. R. H.* 410. *Tab.* 231. *Snail Trefoil.*

The Characters are,

The Flower hath a cylindrical erect Empalement of one Leaf, cut at the Brim into 5 equal acute Segments. The Flower is of the Butterfly Kind, having an oval erect Standard whose Borders are reflexed. The Wings are oblong, oval, and fixed to the Keel by an Appendix. The Keel is oblong, bifid, obtuse, and reflexed. It hath 10 Stamina 9 of which are joined, and the other single, terminated by small Summits; and an oblong Germen, which fits upon a short Style, is involved with the Stamina by the Keel, and crowned by a very small Stigma. The Germen turns to a long compressed Pod, twisted into the Form of a Snail, inclosing many Kidney-shaped Seeds.

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The Species are,

1. *MEDICAGO pedunculis racemosis, leguminibus coebleatis, spinosis, caule procumbente tomentoso.* H. C. 378. *Medicago* with branching Foot Stalks, Snail-shaped prickly Pods, and a trailing woolly Stalk. This is the *Medica Marina*. Lob. Sea Medick, or Snail Trefoil.

2. *MEDICAGO leguminibus coebleatis inermibus, stipulis dentatis, caule anguloso diffuso, foliis oblongo ovatis acutè dentatis.* *Medicago* with smooth Snail-shaped Pods, indented Stipulæ, an angular diffused Stalk, and oblong oval small Leaves sharply indented. This is the *Medica scutellata*. J. B. Snail Trefoil, commonly called Snails.

3. *MEDICAGO leguminibus tornatis inermibus, stipulis acutè dentatis, foliis serratis.* *Medicago* with a turned smooth Pod, acute indented Stipulæ, and the small Leaves sawed. *Medica tornata minor lenis.* Park. Tb. 1116. Snail Trefoil with a smaller turned smooth Fruit.

4. *MEDICAGO leguminibus coebleatis spinosissimis aculeis utrinque tendentibus.* *Medicago* with very prickly Snail-shaped Pods, whose Spines point every Way. *Medica magno fructu, aculeis sursum & deorsum tendentibus.* Tourn. Snail Trefoil with a large Fruit, whose Spines point upward and downward, commonly called Hedgehog.

5. *MEDICAGO leguminibus coebleatis spinosis, foliis acutè dentatis tricuspidibusque.* *Medicago* with prickly Snail-shaped Pods, whose Lobes are acutely indented, and terminate in three Points. This is the *Medica coebleata di-carpos capsulâ rotundâ, spinosâ foliis eleganter dissectis.* H. L. B. Snail-shaped Trefoil, having a double Fruit with a round prickly Capsule, and elegantly cut Leaves.

There are many other Species of this Genus, which grow naturally in the warm Parts of Europe, and are frequently preserved in Botanick Gardens for Variety; but as these are rarely cultivated in other Gardens, so it would be beside my purpose to enumerate them here.

The first Sort grows naturally on the Borders of the Mediterranean Sea; this is a perennial Plant, with trailing woolly Branches about a Foot long, divided into small Branches garnished with trifoliate downy Leaves at each Joint, which are small, Wedge-shaped, and stand on short Foot Stalks. The Flowers are produced from the Side and Ends of the Branches, in small Clusters; they are a bright yellow, and succeeded by small roundish Snail-shaped Fruit, which are downy and armed with a few short Spines. The Flowers appear in June and July; the Seeds ripen in September.

This Plant is propagated by Seeds, which should be sown on a warm Border of dry Soil in Spring, where they are designed to remain; when the Plants come up, 2 or 3 of them may be transplanted into small Pots to be sheltered in Winter, because in severe Frost, those in the open Air are frequently destroyed; though they will endure the Cold of our ordinary Winters, if they are growing in a dry Soil and a sheltered Situation. Those Plants which are left remaining, will require no other Culture but to thin them where they are too close, and keep them clean from Weeds. This Sort may also be propagated by Cuttings, planted in June or July, in a shady Border, covering them close with a Glass to exclude the external Air; these will take Root in about six Weeks Time, and may then be planted in a warm Border or in Pots, and treated as the seedling Plants.

The 2d Sort is an annual, which grows naturally in

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the warm Parts of Europe, but in England is frequently cultivated in Gardens, for the Oddness of its Fruit, which is twisted in the Form of a Snail, and as it ripens turns to a dark brown Colour, so as to have the Appearance of Snails feeding on the Plants at the first View. This hath trailing Branches, the Flowers are of a pale yellow, and come out from the Side of the Branches. These appear in June and July, and the Seeds ripen in Autumn. It is propagated by Seeds, sown in the Middle of April, where the Plants are to remain; they should be thinned where too close, and kept clean from Weeds, which is all the Culture they require.

The 3d Sort is also an annual Plant, which grows in the same Countries as the former. This hath trailing Branches, and yellow Flowers like the 2d Sort, but the Fruit is much longer and closer twisted, so as to resemble the Figure of a vessel called a Pipe, being less at each End than in the Middle. This is frequently kept in Gardens for Variety, and may be propagated and treated in the same Way as the 2d Sort.

The 4th Sort is also an annual, which was formerly more cultivated in the English Gardens than at present. The Stalks, Leaves, and Flowers, are like those of the 2 former Sorts, but the Fruit is much larger, and closely armed with long Spines like a Hedgehog, from whence it had the Title; these Spines point every Way, so that it is difficult to handle the Fruit without smarting for it. This is propagated by Seeds as the 2d Sort, and the Plants require the same Treatment. It flowers in June, and the Seeds ripen in September.

The 5th Sort grows naturally in Syria; it is an annual Plant with trailing Stalks like the former; the Lobes of the trifoliate Leaves are Wedge-shaped, sharply indented on the Edges, and at the Top have 3 acute Points. The Flowers are a pale yellow, and the Fruit Snail shaped but small, and armed with many weak Spines. It flowers the same Time with the former, and may be cultivated the same Way.

MEDLAR. See Mespilus.

MELAMPYRUM. Tourn. Inst. R. H. 173. Tab. 78. Lin. Gen. Plant. 560. *Melampyrum*, of *melas*, black, and *pyrum*, Wheat.] Cow Wheat.

The Characters are,

The Flower has a permanent Empalement of one Leaf, which is tubulous, and cut into 4 Segments at the Brim. The Flower is of the Lip Kind, having an oblong recurved Tube compressed at the Brim; the upper Lip is formed like a Helmet, and is compressed and indented at the Top; the under Lip is plain, erect, and cut into 3 Segments at the Top, which are equal and obtuse. It hath 4 Awl-shaped Stamina which are curved under the upper Lip, two of which are shorter than the other, terminated by oblong Summits; and in the Center is situated an acute-pointed Germen, supporting a single Style crowned by an obtuse Stigma. The Empalement afterward turns to an oblong acute-pointed Capsule with 2 Cells, inclosing 2 pretty large oval Seeds.

The Species are,

1. *MELAMPYRUM florum conjugationibus remotis, corollis clausis.* Flor. Suec. 513. Cow Wheat with the Foot Stalks of the Flowers standing at a Distance, and the Petals shut. This is the *Melampyrum luteum latifolium*. C. B. P. 234. Broad-leaved yellow Cow Wheat.

2. *MELAMPYRUM. species quadrangularibus compatis obtusis*

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obtusis imbricatis. Flor. Suec. 510. Cow Wheat with compact quadrangular Spikes, which are obtuse and imbricated. This is the *Melampyrum luteum angustifolium. C. B. P. 234.* Yellow narrow-leaved Cow Wheat.

3 *MELAMPYRUM spicis conicis laxè spicatis. Prod. Leyd. 298.* Cow Wheat with loose conical Spikes of Flowers. This is the *Melampyrum purpurascens comà. C. B. P. 234.* Cow Wheat with purplish Tops.

4. *MELAMPYRUM bracteis cordato-lanceolatis, summis coloratis sterilibus, calycibus lanatis. Flor. Suec. 512.* Cow Wheat with Heart Spear-shaped Bractææ, sterile coloured Tops, and woolly Empalements. *Melampyrum comà cærulea. C. B. P.* Cow Wheat with blue Tops.

These Plants are seldom cultivated in Gardens. The 1st Sort grows naturally in Woods, in many Parts of England. The 2d Sort grows plentifully in Bedfordshire and Cambridgeshire. The 4th Sort grows in the northern Parts of Europe. The 3d Sort grows naturally in some of the sandy Lands in Norfolk, though not in great Plenty; but in West Friesland and Flanders it grows very plentifully among the Corn; and Clusius says, it spoils their Bread, making it dark; and that those who eat of it, used to be troubled with Heaviness of the Head, in the same Manner as if they had eaten Darnel or Cockle: But Mr. Ray says, He has eaten of this Bread very often, but could never perceive that it gave any disagreeable Taste, or that it was accounted unwholesome by the Country People, who never endeavoured to separate it from the Corn: And Tabernaemontanus declares, He has often eaten it without any Harm; and says, it makes a very pleasant Bread. It is a delicious Food for Cattle, particularly for fattening of Oxen and Cows, for which Purpose it may be cultivated.

The Seeds of these Plants should be sown in Autumn soon after they are ripe, otherwise it seldom grows the first Year; when the Plants come up, they must be weeded in Spring while young, and as soon as they begin to shew their Flowers, the Cattle may be fed upon it; but the should be confined to a certain Space, and not permitted to run over the whole Field to trample it down, which would destroy a great Part of it.

The 3d and 4th Sorts make a pretty Appearance, with their purple and blue Tops, during the Months of July and August. They are all of them annuals.

MELASTOMA. Lin. Gen. Plant. 481. Grossularia. Sloan. Hist. Jam. American Goose-berry Tree, vulgò.

The Characters are,

The Flower has a permanent Empalement of one Leaf swelling like a Bladder, and obtuse. It hath five roundish Petals, which are inserted into the Border of the Empalement; and ten short Stamina, terminated by long erect Summits a little curved. Under the Flower is situated a roundish Germen, supporting a slender Style, crowned by an incurved indented Sigmoid. The Germen afterward turns to a Berry with five Cells, covered by the Empalement which crowns it, and contains many small Seeds.

The Species are,

1. *MELASTOMA foliis denticulatis ovatis acutis. Lin. Sp. Plant. 389.* Melastoma with oval, acute-pointed, indented Leaves. This is the *Grossularia Americana, plantaginis folio amplissimo. Plum. Sp. 18.* American Gooseberry with a Plantain Leaf.

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2. *MELASTOMA foliis denticulatis ovatis acuminatis, nervis interioribus ante basin coadunatis. Lin. Sp. Pl. 390.* Melastoma with oval indented Leaves ending in acute Points, whose inner Veins join before they reach the Base. *Grossularia alia plantaginis folio, fructu rariore violaceo. Plum. Sp. 18.* Another Plantain leaved Gooseberry, bearing a few Fruit which are of a Violet Colour.

3. *MELASTOMA foliis denticulatis lanceolatis quinque-nerviis, caule hispido. Lin. Sp. 390.* Melastoma with Spear-shaped indented Leaves, marked with five Veins, and a prickly Stalk. This is the *Grossularia plantaginis folio angustiore hirsuto. Plum. Sp. 18.* Gooseberry with a hairy, narrow, Plantain Leaf.

4. *MELASTOMA foliis integerrimis ovato-lanceolatis subtus sericeis, nervis ante basin coadunatis. Hort. Cliff. 162.* Melastoma with very entire oval Leaves, which are Spear-shaped and silky beneath, and Nerves joining near the Base. This is the *Arbor racemosa Brasiliensis, folio Malabathri. Breyn. Cent.* The branching Tree of the Brazils, with a Malabathrum Leaf.

5. *MELASTOMA foliis lanceolatis utrinque glabris nervis tribus ante basin coadunatis. Hort. Cliff. 162.* Melastoma with Spear-shaped Leaves smooth on both Sides, and three Veins which join before they reach the Base. This is the *Grossularia fructu non spinoso, Malabathri foliis oblongis, floribus herbaceis racemosis, fructu nigro. Sloan. Cat. 165.* Gooseberry without Spines, having oblong Leaves like those of the Malabathrum, and herbaceous Flowers growing in long Bunches.

6. *MELASTOMA foliis lanceolatis, nervis tribus longitudinalibus, subtus glabris coloratis. H. C. Melastoma* with Spear-shaped Leaves having 3 longitudinal Veins, smooth and coloured on their under Side.

7. *MELASTOMA foliis lanceolato-ovatis quinque nervibus scabris. Flor. Zeyl. 171.* Melastoma with Spear-shaped oval Leaves which are rough, and have five Veins. This is the *Melastoma quinque nervia birta major, capitulis sericeis villosis. Burm. Zeyl. 155.* Greater hairy Melastoma with five Veins, and silky hairy Heads.

8. *MELASTOMA foliis oblongo-ovatis minutissimè denticulatis infernè sericeis quinquenerviis, floribus racemosis. Melastoma* with oblong oval Leaves having very small Indentures on the Edges, and being silky on their under Side, with five Veins, and Flowers growing in long Bunches. *Grossularia fructu, arbor maximo non spinosa, Malabathri folio maximo inodora, flore racemoso albo. Sloan.* Gooseberry without Thorns growing to a large Tree, with a large scarlet Leaf like that of Malabathrum, and white Flowers growing in long Bunches.

9. *MELASTOMA foliis denticulatis ovatis acuminatis, infernè nitidissimis, petiolis longissimis. Melastoma* with oval acute-pointed Leaves, indented on their Edges, very shining on their under Side, and very long Foot Stalks.

10. *MELASTOMA foliis cordatis acuminatis integerrimis, infernè incanis, floribus umbellatis. Melastoma* with Heart-shaped, acute-pointed, entire Leaves, hoary on their under Side, and Flowers growing in Umbels. This is the *Sambucus Barbadosensis dicta, foliis subincanis. Pluk. Phyt. Tab. 221. fol. 6.* Barbadoes Elder, whose Leaves are hoary on their under Side.

11. *MELASTOMA foliis oblongo-cordatis acuminatis, denticulato-ferratis, floribus racemosis sparsis. Melastoma* with oblong, Heart-shaped, acute-pointed Leaves, having

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ing sawed Indentures, and Flowers growing thinly in long Bunches.

12. MELASTOMA *foliis ovato-lanceolatis, quinquenerviis, subtus aureis, floribus verticillatis, caule tomentoso.* Melastoma with oval Spear-shaped Leaves having five Veins, of a Gold Colour on their under Side, and Flowers growing in Whorls, with a woolly Stalk.

13. MELASTOMA *foliis lanceolatis acutis denticulatis infernè incanis trinerviis, floribus racemosis.* Melastoma with acute Spear-shaped Leaves which are indented on their Edges, hoary on their under Side, and have three Veins, and Flowers growing in Bunches.

14. MELASTOMA *foliis ovato-lanceolatis acuminatis integerrimis, utrinque glabris trinerviis, floribus racemosis.* Melastoma with entire, oval, Spear-shaped Leaves ending in acute Points, and having three Veins, and being smooth on both Sides, with Flowers growing in long Bunches. This is the *Arbor Syriamensis, canella folio utrinque glabra.* Pluk. Surinam Tree with a Cinnamon Leaf, which is smooth on both Sides.

15. MELASTOMA *foliis ovatis quinquenerviis scabris, floribus racemosis alaribus.* Melastoma with oval rough Leaves having five Veins, and Flowers growing in Bunches from the Sides of the Branches.

16. MELASTOMA *foliis lanceolatis trinerviis glabris, marginibus bispidis.* Melastoma with smooth Spear-shaped Leaves having three Veins, and hairy Prickly Borders.

17. MELASTOMA *foliis ovatis quinquenerviis glabris, marginibus bispidis.* Melastoma with oval smooth Leaves having five Veins, and hairy prickly Borders.

18. MELASTOMA *foliis ovato-lanceolatis scabris acuminatis quinquenerviis, floribus racemosis.* Melastoma with oval, Spear-shaped, acute-pointed Leaves, having five Veins, and Flowers growing in long Bunches.

The Title of this Genus was given by Professor Burman of Amsterdam, in the *Tbesaurus Zeylanicus*; some of these Plants have been titled *Sambucus*, others *Christophoriana*, and to some of the Species Dr. Plukenet gave the Title of *Acidendron*; but Sir Hans Sloane and Father Plumier, have given them the Title of *Grossularia*, from whence I have applied the English Name of Gooseberry to them, which is the Name by which some of the Sorts are known in America.

The 1st Sort rises 4 or 5 Feet high, the Stem and Branches being covered with long russet Hairs; the Leaves are placed on the Branches by Pairs, growing opposite; they are 5 Inches long and 2 broad, and are also covered with the same russet Down, having 5 Ribs or Veins running through the Leaves from End to End, but the 3 inner join before they reach the Base, with small transverse Ribs; the Fruit is produced at the End of the Shoots, which is a pulpy blue Berry; as large as a Nutmeg.

The 2d Sort grows to a large Tree, having many crooked Branches, covered with a brown Bark; the Leaves are placed by Pairs opposite on the Branches; these Leaves are smooth, entire, and above 5 Inches long, and 2 broad in the Middle with 3 deep Veins running through them; both Sides of these Leaves are of a fine light green and smooth, and are sharply indented on their Edges, ending in acute Points; the Fruit grows in loose Spikes at the End of the Branches, they are thinly placed on the Spikes, and of a Violet Colour.

The 3d Sort grows 20 Feet high, with a large

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Trunk covered with a russet Bark; the Leaves are very large, being above 7 Inches long, and 3 and a Quarter broad, of a dark russet Colour on their upper Side, but of a yellowish russet on their under, soft to the Touch, having a Down over them; the Stalks are covered with rough Hairs, and the Leaves are placed by Pairs on the Branches, which make a beautiful Appearance when the Trees are viewed at a Distance.

The 4th Sort seldom grows more than 8 or 10 Feet high, the Leaves are about 4 Inches long, having 3 Veins running the whole Length, which join before they reach the Base; they are entire, and of a Sattin Colour on their under Side, but of a light green on their upper; these are placed by Pairs on the Branches.

The 5th Sort seldom grows more than 7 or 8 Feet high, spreading out into many Branches, covered with a smooth purple Bark; they are slender, and garnished with Spear-shaped Leaves, 5 Inches long and 2 broad in the Middle, where they are broadest; they are smooth on both Sides, their Edges are entire, and terminate in acute Points. The Flowers are produced in pretty long hanging Bunches, they are of an herbaceous Colour, with long Styles which are stretched out a good Length beyond the Petals, and are permanent; the Fruit is small, and black when ripe.

The 6th Sort rises 4 or 5 Feet high, dividing into many slender Branches, which are smooth, and garnished with Spear shaped Leaves 3 Inches long, and one and a Quarter broad, of a lucid green on the upper Side, but white on the under, smooth, having three longitudinal Veins which join before they reach the Base; these are entire, and placed alternately on the Branches. The Flowers are produced in a loose Panicle at the End of the Branches, they are small, white, and have pretty long Tubes; these are succeeded by small purple Fruit.

The 7th Sort rises with an angular Stalk, 6 or 7 Feet high, sending out Branches by Pairs opposite, garnished with Spear-shaped, oval, rough Leaves, placed opposite by Pairs; they are hairy, of a dark green on their upper Side, but of a pale green on their under. The Flowers are produced at the End of the Branches, 2 or 3 standing together; they are large, and of a Rose Colour inclining to purple, sitting in large hairy Empalements; these are succeeded by roundish purple Fruit crowned by the Empalement, which are filled with a purple Pulp surrounding the Seeds.

The 8th Sort rises 20 Feet, with a large strait Stem, covered with a gray Bark, and at the Top divides into many angular Branches; these are garnished with oblong oval Leaves near a Foot long, and six inches broad in the Middle, of a dark green on their upper Side, but silky on their under, with five strong longitudinal Veins; they are indented on their Edges, and placed by Pairs opposite. The Flowers are produced in long loose Bunches at the End of the Branches; these are white, and are succeeded by roundish purple Fruit, filled with Pulp, in which the Seeds are lodged.

The 9th Sort rises with a strong erect Stalk near 30 Feet high, covered with a gray Bark, dividing at Top into several angular compressed Branches, garnished with oval Leaves indented on their Edges; they are 7 Inches long and almost 5 broad, standing by Pairs opposite on very long Foot Stalks, of a lucid green on their

upper Side, but of a pale Gold Colour and fatty on their under, with 5 strong longitudinal Veins, and a great Number of smaller transverse ones. The Fruit is produced in loose Panicles at the End of the Branches; they are white, and are succeeded by purple Fruit, about the same Size of the former.

The 10th Sort rises with a shrubby Stalk 10 or 12 Feet high, covered with a hairy Bark, and divides into many Branches toward the Top, garnished with Heart-shaped Leaves ending in acute Points, they are 5 Inches long and 3 broad toward their Base, entire on their Borders, of a dark green on their upper Side, but hoary on their under, with 5 longitudinal Veins, and many smaller transverse ones; these are placed opposite by Pairs, and stand upon hairy Foot Stalks, 2 Inches and a Half in Length. The Flowers are produced at the End of the Branches, in a Sort of Umbel; they are of a pale Rose Colour and pretty large, sitting in hairy Empalements; these are succeeded by small black Fruit, a little larger than Elder Berries.

The 11th Sort rises with a shrubby Stalk about 8 or 9 Feet high, covered with a dark brown Bark, and divides at the Top into many straggling Branches, garnished with oblong Heart-shaped Leaves six Inches long, and 3 broad toward their Base, ending in acute Points; these are indented on their Edges, with sharp Serratures; they are smooth on both Sides, and of a light green Colour. The Flowers are produced in very loose Bunches at the End of the Branches, they are small, of an herbaceous Colour, and are succeeded by small Fruit, of a dark Colour when ripe.

The 12th Sort rises with a shrubby Stalk 5 or 6 Feet high, dividing into many smaller Branches, which are covered with a hairy woolly Bark, of a rusty Iron Colour; these are garnished with oval Spear-shaped Leaves, one Inch and a Half long, and three Quarters broad in the Middle; they are of a dark green on their upper Side, of a rusty Iron Colour on their under, having 5 longitudinal Veins; they are placed opposite, and sit close to the Branches. The Flowers come out in Whorls at the Joints of the Stalks, they are small, of a purplish Colour, and are succeeded by small black Fruit.

The 13th Sort is a low Shrub, seldom rising more than 3 Feet high, dividing at the Bottom into slender Branches, garnished with Spear-shaped Leaves, ending in acute Points; these are 5 Inches long, and one and a Half broad in the Middle, sawed on their Edges, of a dark green on their upper Side, and a hoary white on their under, having 3 longitudinal Veins; they are placed opposite, on short Foot Stalks. The Flowers are produced in loose Bunches at the End of the Branches, they are white, and are succeeded by small purple Fruit.

The 14th Sort hath a shrubby Stalk 8 or 9 Feet high, divided into many slender Branches which are smooth, and garnished with oval Spear-shaped Leaves, 7 Inches long and 3 broad, ending in acute Points; they are entire on their Edges, smooth on both Sides, stand opposite by Pairs, and have 3 longitudinal Veins. The Flowers are produced in loose Panicles at the End of the Branches, and are succeeded by very small purple Fruit.

The 15th Sort rises with several shrubby Stalks 5 or 6 Feet high, dividing into several crooked Branches,

garnished with oval Leaves 3 Inches long, and almost as much broad, having 5 longitudinal Veins; they are rough, of a dark green on their upper Side, but of a pale green on their under Side, indented on the Edges, standing on very hairy Foot Stalks; they are sometimes opposite, and at others alternate on the Branches. The Flowers are produced in very loose Bunches, which come out from the Side of the Stalks; they are small, of an herbaceous Colour, and are succeeded by small purplish Fruit, filled with very small Seeds.

The 16th Sort rises with a shrubby Stalk 7 or 8 Feet high, and divides into many smooth Branches, garnished with Spear-shaped Leaves about 4 Inches long, and one Inch and a Quarter broad in the Middle; they are smooth on both Sides, of a dark green Colour, and have 3 longitudinal Veins; the Edges of these Leaves are closely set with bristly stinging Hairs. The Flowers are produced in loose Bunches at the End of the Branches; they are small, of a purplish Colour, and are succeeded by very small black Fruit.

The 17th Sort is like the former, but the Leaves are oval, a little more than 2 Inches long, and one and a Quarter broad; these have 5 longitudinal Veins, are smooth on both Sides, of a dark green, and stand opposite by Pairs on short Foot Stalks. The Flowers grow in loose Bunches at the End of the Branches, they are larger than the former Sort, but the same Colour. The Edges of the Leaves of this Sort, are closely set with stinging Hairs.

The 18th Sort rises with a shrubby Stalk 8 or 9 Feet high, dividing into Branches by Pairs standing opposite, as do also the Leaves, which are 7 Inches long and 3 broad, rough on their Surface, entire on their Edges, ending in acute Points; they are of a light green on both Sides, and stand on short Foot Stalks. The Flowers are produced in large loose Panicles at the End of the Branches, they are small, white, and are succeeded by small, round, purple Fruit.

All the Sorts are Natives of the warm Parts of *America*, where there are many more Species than are here enumerated. Most of these here mentioned, were found by the late Dr. *Houssoun*, growing naturally in *Jamaica*, from whence he sent many of their Seeds to *Europe*, some of which succeeded; but most, if not all the Plants which were raised from them, were lost in the severe Winter in 1740, since which Time they have not been recovered in *Europe*.

There is great Beauty in the Diversity of the Leaves of these Plants, many of them being very large, and most of them of different Colours on the two Surfaces, their under Side being either white, Gold Colour, or russet, and their upper of different Shades of green, so that they make a fine Appearance in the hot House all the Year; indeed, their Flowers have no great Beauty to recommend them, but yet for the singular Beauty of their Leaves, these Plants deserve a Place in all curious Collections.

There are very few of these Plants at present in any of the *European* Gardens, which may have been occasioned by the Difficulty of bringing over growing Plants from the *West-Indies*; and the Seeds being small when they are taken out of the Pulp, soon become dry, so seldom succeed. The best Way to obtain these Plants

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is, to have the entire Fruits put up in dry Sand, as soon as they are ripe; and forwarded by the soonest Conveyance to England; these should be immediately taken out when they arrive, and the Seeds sown in Pots of light Earth, and plunged into a moderate hot Bed of Tanners Bark. When the Plants come up, and are fit to remove, they must be each planted in a small Pot of light Earth, and plunged into the Tan Bed; and may afterward be treated as directed for the *Annona*, to which I shall direct the Reader to turn, to avoid Repetition.

MELIA. Lin. Gen. Plant. 473. *Azederach*. Tourn. Inst. R. H. 616. Tab. 387. The Bead Tree.

The Characters are,

The Empalement of the Flower is small, erect, and of one Leaf, cut into 5 obtuse Points at the Top. The Flower hath 5 long narrow Spear-shaped Petals which spread open, and a cylindrical Nectarium of one Leaf the Length of the Petals, indented at the Brim in 10 Parts. It has 10 small Stamina inserted in the Top of the Nectarium, terminated by Summits which do not appear above the Nectarium, with a conical Germen supporting a cylindrical Style, crowned by an obtuse indented Stigma. The Germen turns to a soft globular Fruit, including a roundish Nut having 5 rough Furrows, and 5 Cells, each containing one oblong Seed.

The Species are,

1. MELIA foliis bipinnatis. Flor. Zeyl. 162. *Melia* with doubly winged Leaves. This is the *Azederach*. Dod. Pempt. 848. The Bead Tree, or false Sycamore.

2. MELIA foliis pinnatis. Hort. Cliff. 161. *Melia* with winged Leaves. *Azederach sempervirens* & *florens*. Tourn. Ever-green and always flowering Bead Tree.

The first Sort grows naturally in Syria, from whence it was brought to Spain and Portugal, where it is now become as common almost, as if it were a Native of those Countries. This in warm Countries grows to a large Tree, spreading out many Branches, garnished with winged Leaves composed of 3 smaller Wings, whose Lobes are notched and indented on their Edges; they are of a deep green on their upper Side, and paler on the under. The Flowers come out from the Side of the Branches in long loose Bunches, they are composed of 5 long narrow Spear-shaped Petals, of a blue Colour; these are succeeded by oblong Fruit as large as a small Cherry, green at first, but when ripe changes to a pale yellow, inclosing a Nut with 5 deep Furrows, having 4 or 5 Cells, in each of which is lodged one oblong Seed. This produces its Flowers in England in July, but are not often succeeded by Seeds here; it drops its Leaves in Autumn and puts out fresh in Spring. The Pulp which surrounds the Nut, is said to have a deadly Quality if eaten, and if mixed with Grease and given to Dogs, will kill them. The Nuts are bored through, and strung by the Roman Catholicks as Beads.

There has been of late some of these Plants introduced to the Islands in the West Indies, where they continue flowering, and produce Fruit most Part of the Year. The Fruit I have received from thence by the Title of Indian Lilac, from which I have raised many Plants, and find them the same as that from Syria.

This Sort is propagated by Seeds (which may be obtained from Italy or Spain, where these Trees annually produce ripe Fruits in the Gardens where they are planted;) the Seeds or Berries should be sown in Pots

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filled with good fresh light Earth, and plunged into a hot Bed of Tanners Bark, where (if the Seeds are fresh) they will come up in about 2 Months Time: When the Plants come up, water them frequently, and let them have a large Quantity of free Air, by raising the Glasses every Day; in June expose them to the open Air, in a well sheltered Situation, that they may be hardened before Winter. In October remove the Pots under a hot Bed Frame where they may enjoy free open Air when the Weather is mild, and be covered in hard Frost. During the Winter Season, you must refresh them gently with Water, but by no Means repeat this too often, nor give them too much at a Time; for their Leaves being off, they will not be in a Condition to throw off a Superfluity of Moisture.

In March following, you may shake out your Plants from the Seed Pots and divide them, planting each into a small Pot, filled with light fresh Earth, plunging them into a moderate hot Bed, which will greatly promote their rooting, and increase their Growth; do not draw them too much, but give them a large Share of Air, when the Weather is good; and in June, remove them out into the open Air as before, and during the three or four Winters, while the Plants are young, you must shelter them, to secure them from the Cold; but when the Plants are grown pretty large and woody, they will endure to be planted in the open Air. The best Season for this is in April, at which Time you should shake them out of the Pots, being careful not to break the Earth from the Roots, but only pare off with a Knife the Outside of the Ball of Earth; then open your Holes and put in the Plant, closing the Earth to its Roots, observing if the Weather is dry, to give it some Water, which should be repeated twice a Week, until the Plants have taken Root; but you must observe to plant them on a dry Soil and in a warm Situation, otherwise they will be liable to miscarry in severe frosty Weather.

Some of these which were planted in an open Exposure, have endured the Cold of our ordinary Winters very well; but when a severe frost happens, they are generally killed, or at least their Shoots are destroyed to the main Stem; therefore it is much more secure to plant them against good aspected Walls, where they will live and produce their Flowers annually, and in warm Seasons they may have Fruit.

The 2d Sort grows naturally in India, where it becomes a large Tree; the Stem is thick, the Wood of a pale yellow, and the Bark of a dark purple and very bitter. The Branches extend wide on every Side, and are garnished with winged Leaves, composed of 5 or 6 Pair of oblong, acute-pointed Lobes, terminated by an odd one; these are sawed on their Edges, of a light green Colour, and a strong disagreeable Odour; they stand upon pretty long Foot Stalks which come out sometimes opposite, and at others they are alternate. The Flowers are produced in long branching Panicles which proceed from the Side of the Branches; they are small, white, and sit in small Empalements, which are cut into 5 acute Segments; these are succeeded by oval Fruit of the Size of small Olives, which are green, afterward yellow, and, when ripe, they change to a purple; the Pulp which surrounds the Nut is oily, acrid, and bitter; the Nut is white and shaped like

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like that of the former. It grows in sandy Land, both in India and the Island of Ceylon, where it is always green, and produces Flowers and Fruit twice a Year.

This Sort is now very rare in England, and also in the Dutch Gardens, where some Years past it was more common; it is propagated by Seeds, as the other Sort, but being much tenderer, the Plants should be kept constantly in the Tan Bed. In the Summer they may be placed under a Frame, but in Winter they must be removed into the Bark Stove, and treated as other Plants from the same Countries. When the Plants have obtained Strength, they may be treated more hardily, by placing them in Winter in a dry Stove, and in the Middle of Summer they may be placed abroad for 2 or 3 Months in a warm sheltered Situation, but they should not remain too long abroad; and during the Winter Season should be sparingly watered; with this Management the Plants will produce Flowers annually, and as they retain their Leaves all the Year, they are ornamental in Winter in the Stove.

The first Sort is commonly called, *Zizyphus alba*, in Portugal and Spain, and in Italy *Pseudocycnorus*. It was by most of the modern Botanists titled, *Azederach*, but Dr. Linnaeus has altered it to this of *Melia*, which was by Theophrastus applied to a Species of Ash.

MELIANTHUS. Tourn. Inst. R. H. 430. Tab. 245. Lin. Gen. Plant. 712. *Melastoma*, Honey Flower.

The Characters are,

The Flower has a large coloured unequal Emplacement divided into 5 Segments, the 2 upper are oblong and erect, the lower is short, and shaped like a Bag; the Middle are Spear-shaped and opposite. It hath 4 narrow Spear-shaped Petals, reflexed at their Points, spreading open outward, and shaped like the Emplacement into two Lips, connected on their sides. It has a Nectarium of one Leaf, situated in the lower Segment of the Emplacement, and fastened with it to the Receptacle; it is short, compressed on the Sides, and cut on the Margin. It hath 4 erect Awl-shaped Stamina, the 2 under being somewhat shorter than the other, terminated by oblong Heart-shaped Summits. In the center is situated a four-cornered Germen, supporting an erect Style, crowned by a quadrid Stigma. The Germen becomes a quadrangular Capsule with distended Cells, divided by Partitions in the Center, each containing one almost globular Seed, fixed to the Center of the Capsule.

The Species are,

1. MELIANTHUS *stipulis solitariis petiolo adnatis*. Hort. Cliff. 492. Honey Flower with single Stipulae growing close to the Foot Stalk. *Meliantbus Africanus*. H. L. B. 414. African Honey Flower, or greater *Meliantbus*.

2. MELIANTHUS *stipulis geminis distinctis*. Hort. Cliff. 492. Honey Flower with two distinct Stipulae. This is the *Meliantbus Africanus minor foetidus*. Com. Rar. Pl.

4. Tab. 4. Smaller stinking African Honey Flower.

The 1st Sort grows naturally at the Cape of Good Hope, from whence it was brought to Holland in 1672; this hath a ligneous perennial Root, which spreads far on every Side, from which arise many Stalks, which are hollow, and become woody; these rise 6 or 7 Feet high, and are herbaceous toward the Top, where they are garnished with large winged Leaves, which embrace the Stalks with their Base, where they have large single Stipulae fastened on the upper Side of the Foot Stalk, with 2 Ears at the

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Base, which also embrace the Stalk. The Leaves have 4 or 5 Pair of very large Lobes, and are terminated by an odd one; these are deeply jagged on their Edges into acute Segments, and between the Lobes runs a double leafy Border, or Wing, on the upper Side of the Midrib, so as to connect the Base of the Lobes together; these are also deeply jagged in the same Manner as the Lobes; they are of a gray Colour, and an herbaceous Odour. The Flowers are produced in pretty long Spikes, which arise from the Top of the Stalks; they are of a Chocolate brown Colour; they are formed like the Lip Flowers, but have 4 narrow Petals, in which it differs from the other Plants of this class with Lip Flowers; these are succeeded by oblong four cornered Capsules, divided by a central Partition into 4 Cells, each containing one roundish Seed; this Plant flowers in June, but unless the Season proves warm, is not succeeded by Seeds in England.

This plant was formerly preserved in Green-houses, as a tender Exotick, but if planted in a dry Soil, and a warm Situation, it will endure the Cold of our ordinary Winters very well, and if, in a severe Frost, the Tops of them should be destroyed, yet the Roots will abide, and put forth again the succeeding Spring, so there is no great Danger of losing it; and the Plants which grow in the open Air, always flower much better than those which are preserved in the Green-house, as they are less drawn, which always is hurtful to the flowering of Plants; for it rarely happens, that any of the Plants of this Sort, which are placed in the Green-house, do flower, they are apt to draw up tall and weak, and those Branches which produce Flowers generally decay soon after; so that although the Stems become woody, yet they are not of long Duration, but the Roots spread where they have Room, and send out a great Number of Stalks annually; and when the Plants grow in the full Ground, all those Stalks which are not injured by Frost, seldom fail to flower the Spring following, so that the surest Method to have them flower, is to cover the Shoots in frosty Weather, to prevent their Tops being killed by the Cold, to prevent which, the best Way is to plant them close to a good aspected Wall, on dry Rubbish, in which they will not shoot so vigorous as in good Ground; so will be less succulent, and therefore not so liable to suffer by Cold; but if the Winter proves severe, the Stalks may be fastened up to the Wall, and covered with Mats; for Want of this Care the Stalks are frequently killed to the Ground in Winter, and seldom any Flowers produced.

This Plant may be propagated by taking off its Suckers, or Side Shoots any Time from March to September, observing to choose such as are furnished with Fibres, and after they are planted, they will require no farther Care, but to keep them clear from Weeds; they may also be propagated by planting Cuttings, during any of the summer Months, which, if watered and shaded, will take Root very well, and may afterwards be transplanted where they are designed to remain.

The 2d Sort is also a Native of the Country about the Cape of Good Hope, from whence it was brought to Europe; this rises with round soft ligneous Stalks, 5 or 6 Feet high, which send out 2 or 3 Branches from their Side, garnished with winged Leaves like those of the former Sort, but not half so large, these have two distinct

tinæ Stipulæ adhering to their Foot Stalks; they are of a deep green on their upper Side, and whitish on their under. The Flowers come out from the Sides of the Stalks in loose hanging Bunches, each sustaining 6 or 8 Flowers, which are shaped like those of the first Sort, but smaller; the lower Part of the Petals are green, their upper Part are of a Saffron Colour, and on the Outside, in the swelling Part of the Petals, is a Blush of fine red; these have 2 long and 2 shorter Stamina, terminated by yellow Summits. The Flowers are succeeded by four cornered Seed Vessels, which are shorter than those of the first Sort, in which are lodged 4 oval Seeds, in separate Apartments; this flowers at the same Season with the former.

This Sort does not spread its Roots so much as the first, so is not propagated with so great Facility, but Cuttings planted on an old hot Bed, whose Heat is over, and covered close with Bell, or Hand Glasses, to exclude the Air, will take Root pretty freely; these may be planted in Pots, and sheltered in the Winter under a common Frame for a Year or two, till they have obtained Strength, then they may be planted in a warm Border, and treated as the first Sort, with which Management I have seen them flower much better than any of those which have been treated more tenderly, and these Plants have perfected their Seeds in good Seasons.

MELILOTUS. See Trigonella.

MELISSA. Tourn. Infl. R. H. 193. Tab. 91. Lin. Gen. Plant. 647. Baum.

The Characters are,

The Empalement of the Flower is of the open Bell Shape, angular, streaked, and one Leaf, whose Brim is formed into 2 Lips; the upper Lip is indented in 3 Parts, which are spread open and reflexed; the under Lip is short, acute, and indented in 2 Parts. The Flower is of the Lip Kind, having a cylindrical Tube; the Chaps are gaping, the upper Lip is short, erect, forked, and roundish, indented at the End. The under Lip is trifid, the middle Part being the largest. It hath 4 Awl shaped Stamina, 2 of which are as long as the Petal, but the other are but half as long; they are terminated by small Summits, which join by Pairs. It hath a quadrid Germen, supporting a slender Style, the Length of the Petal, which, with the Stamina, are situated under the upper Lip, and is crowned by a slender bifid reflexed Stigma. The Germen turns to 4 naked Seeds, sitting in the Empalement.

The Species are,

1. MELISSA racemis axillaribus verticillatis, pedicellis simplicibus. Lin. Sp. Pl. 592. Baum with whorled Bunches of Flowers proceeding from the Sides of the Stalks, and single Foot Stalks. This is the *Melissa hortensis*. C. B. P. 229. Garden Baum, or common Baum.

2. MELISSA Romana, mollitur hirsuta & graveolens. H. R. Par. Roman Baum with soft hairy Leaves, and a strong Smell.

3. MELISSA Pyrenaica, caule brevi, plantaginis folio. Tourn. Infl. R. H. 193. Pyrenean Baum with a short Stalk, and a Plantain Leaf.

4. MELISSA foliis oblongo ovatis hirsutis, caule bifolio. Baum with oblong, oval, Hairy Leaves, and a Stalk having two Leaves. This is the *Melissa atrorubens*, bugula folio. Hort. Eltb. Dark red Baum with a Bugle Leaf.

5. MELISSA pedunculis axillaribus dichotomis longitu-

dine florum. Lin. Sp. Plant. 592. Baum with Foot Stalks arising from the Wings of the Stalk, divided by Pairs, and the Length of the Flowers. This is the *Calamintha magno flore*. C. B. P. Calaminth with a large Flower.

6. MELISSA pedunculis axillaribus dichotomis longitudine foliorum. Lin. Sp. Plant. 593. Baum with Foot Stalks arising from the Wings of the Stalk, which are divided by Pairs, and as long as the Leaves. This is the *Calamintha vulgaris* & *officinarum Germaniæ*. C. B. P. 228. Common officinal Calamint of the Germans.

7. MELISSA pedunculis axillaribus dichotomis folio longioribus, caule decumbente. Lin. Sp. Plant. 593. Baum with Foot Stalks arising from the Wings of the Stalk, which are divided by Pairs, and are longer than the Leaves, and a declining Stalk. This is the *Calamintha pulegii odore* sive *nepeta*. C. B. P. 228. Calamint with the Scent of Penny Royal, or Cat Mint,

8. MELISSA racemis terminalibus, pedunculis solitariis brevissimis. Lin. Sp. Pl. Baum with Spikes of Flowers terminating the Stalks, and growing on very short single Foot Stalks. This is the *Calamintha incana cymifolia*. C. B. P. Hoary Calamint with Basil Leaves.

9. MELISSA foliis ovatis glabris, floribus verticillatis sessilibus, pedunculis solitariis brevissimis. Baum with oval smooth Leaves, and Flowers growing in Whorls, sitting close to the Branches, which have very short single Stalks. This is the *Calamintha Romana*, *majoranæ folio*, *pulegii odore*. Bocc. Mus. Roman Calamint with a Marjoram Leaf, and the Scent of Penny Royal.

10. MELISSA frutesca, ramis attenuatis virgatis, foliis subtus tomentosis. Lin. Sp. Plant. 593. Shrubby Baum with slender Twig-like Branches, and Leaves which are woolly on their under Side. This is the *Calamintha Hispanica frutescens*, *mari folio*. Tourn. Infl. 194. Shrubby Spanish Calamint with a Marum Leaf.

The 1st Sort grows naturally on the Mountains near Geneva, and in some Parts of Italy, but is cultivated here in Gardens, as a medicinal and culinary Herb. It has a perennial Root, and annual Stalk, which is square, branching, and rises from 2 to 3 Feet high, garnished with Leaves set by Pairs at each Joint, which are two Inches and a Half long, and almost two Inches broad at their Base, growing narrower toward the Top, indented about their Edges, and the lower ones standing upon long Foot Stalks. The Flowers grow in loose small Bunches at the Wings of the Stalk, in Whorls standing upon single Foot Stalks; they are of the Lip Kind, the upper Lip standing erect, and forked; the under Lip is divided into three Parts; the Middle one is roundish, and indented at the Top. The Flowers are white, and appear in July. The whole Plant has a pleasant Scent, somewhat like Lemons.

It is reckoned to be cordial, cephalick, and good for all Disorders of the Head and Nerves; there is a simple Water of this Herb. It is also used as Tea, and is by some greatly esteemed for that Purpose; there is a Variety of this with striped Leaves.

This Plant is easily propagated by parting the Root; the best Time for this is in October, that the Offsets may have Time to get Root before the Frosts come on. The Roots may be divided into small Pieces, with 3 or 4 Buds to each, and planted two Feet apart in Beds of common Garden Earth, in which they will soon spread and meet

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meet together; the only Culture is to keep it clean from Weeds, and cut off the decayed Stalks in Autumn, stirring the Ground between the Plants.

The 2d Sort grows naturally about *Rome*, and in several Parts of *Italy*; this also hath a perennial Root, and annual Stalk. The Stalks are slender, the Leaves much shorter than the former Sort, and the whole Plant is hairy, and of a strong disagreeable Odour. The Flowers grow in Whorls, sitting pretty close to the Branches, and are smaller than those of the first Sort; it flowers about the same Time. It is seldom preserved in Gardens, but may be cultivated as the former.

The 3d Sort grows naturally on the *Pyrenean* Mountains, and on Mount *Baldus*, near *Verona*. The lower Leaves are near three Inches long, and two and a Quarter broad, obtuse, and crenated on their Edges. The Flower Stalks rise about 6 or 7 Inches high, are almost naked of Leaves, and have small Whorls of purplish Flowers standing round them, which nod downward; these are succeeded by four naked Seeds sitting in the Emplacement. It flowers in *June*, and the Seeds ripen the End of *August*. It has a perennial Root, but may be propagated by Seeds, which should be sown soon after they are ripe, on a shady Border, or by parting the Roots; it delights in Shade, and should have a loamy Soil.

The 4th Sort grows naturally in *Virginia* and *Carolina*; this is a biennial Plant, which flowers and seeds the second Year after it is sown, and then perishes. The Leaves are three Inches long, and an Inch and a Half broad in the Middle, rounded at both Ends, and entire; they are of a dark red Colour, and have many Veins. From the Center of the Leaves arises a Stalk, about a Foot high, which, at about four Inches from the Root, is garnished with two oval oblong Leaves, nearly as large as those at Bottom; the upper Part of the Stalk is naked, and terminated by a Spike of Flowers, under which are two small Whorls of Flowers, the upper one being about half an Inch below the Spike, but the under is an Inch and a Half below that. The Flowers are of a pale purple Colour; they appear in *June*, and the Seeds ripen in *September*.

This is only propagated by Seeds, which should be sown on a Bed of light Earth in Spring, and when the Plants are fit to remove, Part of them may be transplanted on a warm Border, where, if the Winter be not very severe, they will live and flower the following Summer, and perfect their Seeds; but two or three of the Plants should be planted in Pots, and sheltered under a Frame in Winter, to preserve the Species, if those in the open Air should be killed; in the Spring these may be shaken out of the Pots, and planted in a Bed of loose Earth in a sheltered Situation, where the Plants will flower and produce Seeds. The only Culture they require, is to keep them clean from Weeds.

The 5th Sort grows naturally in the Mountains of *Tuscany* and *Austria*, but is preserved in many *English* Gardens for Variety. It hath a perennial Root, and an annual Stalk, which rises about a Foot high, garnished at each Joint with two Leaves, standing opposite, which are an Inch and a Half long, and three Quarters of an Inch broad, sawed on their Edges, of a lucid green on their upper Side, and whitish on their under; from the Wings of the Stalks, come out single Foot

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Stalks, half an Inch long, which divide into two smaller, and each of these sustain two Flowers on short separate Foot Stalks. The Flowers are large, of a purple Colour, and shaped like those of the other Species. It flowers in *June*, and the Seeds ripen in *August*. This may be propagated as the first Sort, and the Plants may be treated in the same Manner.

The 6th Sort is the common Calamint of the Shops, which grows naturally in many Parts of *England*, so is seldom kept in Gardens. It hath a perennial Root, from which arise several square Stalks, near a Foot long, which are hairy, and garnished with two roundish Leaves at each Joint, about the Size of those of Pot Marjoram, a little indented on their Edges, and of a strong penetrating Odour. The Flowers come out in Whorls on the Side of the Stalks, upon Foot Stalks, which divide by Pairs, and are as long as the Leaves; these sustain several small bluish Flowers, which appear in *July*, and are succeeded each by four small roundish black Seeds. The Herb is used in Medicine, and is hotter, and abounds with more subtile and volatile Parts than Mint. It provokes Urine, brings down the Menfes, opens the Liver, and is good for Coughs. This may be planted in Gardens, and treated as the common Baum.

The 7th Sort is found in greater Plenty than the sixth, growing wild in *England*. The Stalks of this are longer, and bend towards the Ground. The Leaves are larger, and more indented on their Edges, and have a very strong Scent like Penny-Royal. The Whorls of Flowers are set closer together than those of the 6th Sort, but in other Respects the agree.

The 8th Sort grows naturally in the South of *France* and in *Italy*; this is not of so long Duration as the former Sorts, seldom continuing more than two or three Years. The Stalks are slender, a little ligneous, and are garnished with small roundish hoary Leaves, placed opposite at each Joint. The Flowers are produced in Whorls toward the upper Part of the Stalks, which are terminated by a loose Spike; they are small and white, shaped like those of the other Species, and appear in *June*; these are succeeded by Seeds, which ripen in Autumn, and if they are permitted to scatter, there will be a sufficient Supply of young Plants.

The 9th Sort grows naturally in *Italy*; this is a biennial Plant, whose Stalks are about eight Inches long, declining toward the Ground, and are garnished with roundish Leaves, about the Size of Marjoram, of a light green Colour. The Flowers come out in close Whorls on the upper Part of the Stalk, each standing on a short separate Foot Stalk; they are large, and of a bright purple Colour, appearing in *July* and *August*, and the Seeds ripen in Autumn; this is propagated by Seeds, which should be sown soon after they are ripe, and then the Plants will come up in the Spring; but when the Seeds are not sown till Spring, they seldom grow till the next Year. The Plants may also be propagated by Cuttings, which, if planted in Summer, and shaded from the Sun, will take Root freely. If these Plants are on a warm Border, they will live through the Winter, but to preserve the Species, a Plant or two should be kept in Pots, and sheltered under a Frame in Winter.

The 10th Sort grows naturally in *Spain*; this hath slender shrubby Stalks, about nine Inches long, which

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put out small Side Branches, opposite, and are garnished with small, hoary, oval pointed Leaves, placed by Pairs, these have much the Appearance of those of the *Marum*. The Flowers grow in whorled Spikes, at the End of the Stalks; they are small and white, appearing in July, and the Seeds ripen in Autumn. The whole Plant has a strong Scent of Penny-Royal; this Plant is of as short Duration as the ninth Sort, and may be propagated either by Seeds or Cuttings, in the same Way.

MELISSA TURCICA. See *Dracocephalon*.

MELO. *Tourn. Infl. R. H.* 104. *Tab.* 32. *Cucumis* *Lin. Gen. Plant.* 969. A Melon.

The Characters are,

It hath male and female Flowers on the same Plant. The male Flowers have a Bell-shaped Empalement of one Leaf, whose Border is terminated by five Awl-shaped Bristles. The Flower is of one Petal, which is Bell-shaped, fastened to the Empalement, and cut into five Segments at the Brim; these are veined, and rough. It hath three short Stamina inserted in the Empalement, and are joined together, two of which have bifid Points. The Summits are linear, and run up and down on the Outside of the Stamina, to which they adhere. The female Flowers have no Stamina, or Summits, but have a large oval Germen, situated below the Flower, supporting a short cylindrical Style, crowned by three thick gibbous Stigmas. The Germen afterward turns to an oval Fruit with several Cells, filled with oval, acute pointed, compressed Seeds, inclosed in a soft Pulp.

There is a great Variety of this Fruit cultivated in the different Parts of the World, and in this Country there are too many of them propagated, which are of no Value; especially by those who supply the Markets, where their Size is chiefly regarded, so that by endeavouring to augment their Bulk, the Fruit is rendered of no Value; I shall therefore only mention a very few of the Varieties, which are the most deserving of Care, excluding the common Melons, as being unworthy of the Trouble and Expence in cultivating.

The Sort of Melon, which is in the greatest Esteem among all the Curious in every part of Europe, is the *Cantaleupe*; so called from a Place about fourteen Miles from Rome, where the Pope has a Country Seat in which Place this Fruit has been long cultivated; but it was brought thither from that Part of *Armenia*, which borders on *Persia*; where this Fruit is in so great Plenty, that a Horse Load is sold for a French Crown. The Flesh of this Melon, when in Perfection, is delicious, and does not offend the most tender Stomachs, so may be eaten with Safety. The Dutch are so fond of this Fruit, as to cultivate very few other Sorts, and by Way of Pre-eminence, call it only by the Apellation of *Cantaleupe*, and never join the title of Melon to it, which they apply indifferently to all the other Sorts. The outer Coat of this Sort is very rough, and full of Knobs, and Protuberances like Warts, it is of a middling Size, rather round than long, and the Flesh is for the most Part of an Orange Colour, though there are some with a greenish Flesh, but I have never met with any of that Colour, so good as those of the other.

The *Romana* is by some much esteemed, and when the Fruit is well conditioned, the Plants in perfect Health, and the Season dry, it is a good Melon, and may be brought forward in the Season than the *Cantaleupe*.

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taleupe, therefore those who are desirous of early Melons, may cultivate this Sort.

The *Succado* is also a good Sort, and may also be cultivated for early Fruit, but these must give Way to the *Cantaleupe*, when that is in Season.

The *Zatte* is also a very good Melon, but very small. The Fruit of this is seldom larger than an Orange, it is a little flattened at the two Ends, and the outer Coat is warted like the *Cantaleupe*, but there is so little Flesh in one of these Fruit, that they are scarce worthy the Trouble of propagating.

The small *Portugal* Melon, which is by some called the *Dormer* Melon, is a pretty good Fruit, and the Plants generally produce them in Plenty, so by many People this is preferred to most other, especially those who love a Plenty, and are not so nice in distinguishing the Quality; this may also be cultivated for an early Crop.

But the best Melon for this Purpose is the *Black Galloway*, which was brought from *Portugal* by Lord *Galloway*, many Years since, but of late Years is rarely to be met with in *England*, it having been degenerated by growing among other Sorts. The Fruit of this Sort will ripen in a shorter Time from its first setting, than any other which I have yet seen, and when suffered to ripen naturally, is not a bad Fruit.

The few Varieties here mentioned, are sufficient to satisfy the Curious, who may be fond of Variety, for there are scarce any other which deserve the Trouble, and indeed those who have a true Taste for this Fruit, seldom cultivate any but the *Cantaleupe*; as I before observed; where this Fruit is desired early in the Season, the *Cantaleupe* is not so proper as some of the others, therefore a few Plants of one of the other Sorts should be raised earlier in the Spring, but should be in a different Part of the Garden from the *Cantaleupe* Melons, for when two Sorts of Melons grow near, they cannot be preserved perfectly right, therefore the Dutch and German Gardeners are very careful in this Respect, and in order to keep the Sort in Perfection, do not plant any other Sort of Melon, Cucumber, or Gourd, near these, lest, by the Impregnation of the Farina of those other, these Fruit should be rendered bad; and in this Particular, I am convinced, from long Experience, they are right; and from the not observing this, many Persons who are Lovers of this Fruit, have gradually diminished their Goodness, without knowing the Cause, and have imputed it to the long cultivating from the Seeds sowed in the same Garden, believing it absolutely necessary to procure Seeds from a distant Place frequently, to preserve them good; indeed, where a Person can securely depend on the Care and Skill of those he procures the Seeds from, it is a very good Method to exchange Seeds now and then; but there are so few who are exact in making Choice of the Fruits from which they save the Seeds, or careful enough to do it themselves, but often depend on others to clean the Seed, that I should advise every one to do it himself, which is the sure Way to have it good; for I have frequently been deceived myself, by depending on the Fidelity and Skill of others; nor could I procure any of these Seeds from *Cantaleupe*, which were good, until my much honoured Friend, the Chevalier *Ratibeg*, sent me plentifully of it from thence; though I had often been

been supplied with Seeds by Persons who I thought could not be deceived in their Choice, and who lived near the Place of their Growth.

Before I quit this Head, I beg Leave to caution all Persons against depending upon Seeds which are brought from Abroad, either by those Persons who import them for Sale, or Gentlemen who frequently bring or send over these Seeds to their Friends, for it seldom happens that any of these prove tolerable. I have been so often deceived by these myself, as to determine never to make Trial of any of these Seeds again, unless I receive them from a Person who is skilful, and who eat of the Fruit himself, of which he saved the Seeds; for in *Italy, Spain, Portugal*, and many Parts of *France*, the Gardeners are very careless in the Choice of all their Seeds, but of the Melons they are remarkably so; and as for those which come from *Constantinople, Aleppo*, and other Parts of *Turkey*, I have rarely seen one Melon produced from those Seeds which was tolerable.

The Seeds of Melons should not be sown, until they are three Years old, nor would I choose to sow them, when they are more than six; for although they will grow at ten or twelve Years old, yet the Fruit which are produced from those old Seeds are seldom so thick fleshed, as those which come from Seeds which are fresher; and it is the same of light Seeds, which swim upon Water, when they are taken out of the Pulp, for I have made some Trials of these, and have had them grow at three Years old; but not one of the Melons produced on these Plants was near so deep fleshed, as those which grew upon Plants raised from heavy Seeds, taken out of the same Fruit, though they grew in the same Bed, and were cultivated exactly in the same Manner; nor was their Flesh so firm, but rather inclining to be meally; therefore I would not advise sowing these light Seeds, nor those which are very old.

Having thus largely treated of the Choice of the Sorts, and of the Seeds, I shall next proceed to the Method of cultivating them, in order to obtain Plenty of good Fruit; the Method I am going to prescribe being very different from what has been constantly practised in *England*, will, I doubt not, be objected to by many, but it is what has been practised in all the good Gardens in *Holland and Germany*, where the *Cantaleupe* Melon is produced in great Plenty and Perfection; and from several Years Experience, I have found this to be the only Method in which these Melons can be cultivated with Success; and I am likewise convinced of its being the best Way to obtain Plenty of any other Sort of Melon.

It is common to hear many Persons valuing themselves upon having two or three early Melons, which, when brought to Table, are not better than a Pumpkin, although procured at a great Expence and with much Trouble; and in order to have them ripe a little earlier, than they would naturally come, if suffered to grow to their full Size, the Stem upon which the Fruit grows, is commonly twisted, to prevent the Nourishment entering the Fruit, whereby the Growth is checked; then the Fruit is closely covered with the Mowings of Grass Plats, laid of a sufficient Depth to cause a Fermentation, by which the Fruit becomes coloured: But where this unnatural Method is practised, the Fruit hath little Flesh, and that has neither Moisture, Firmness, or Flavour;

so that after four Months Attendance, with a great Expence of Dung, &c. there may, perhaps, be three or four Brace of Melons produced, which are fitter for the Dunghill than the Table. Therefore my advice is, never to attempt to have these Fruit ripe earlier than the Middle of *June*, which is generally soon enough for this Climate; and from that Time to the End of *September*, they may be had in Plenty, if skilfully managed; and when the Autumn has continued favourable, I have had them very good in the Middle of *October*.

But in order to continue this Fruit so long, the Seeds must be sown at two different Seasons; or if at three, it will be still better: The first should be sown about the Middle of *February*, if the Season proves forward; but if it is otherwise, it will be better to defer it till the End of that Month, for the future Success greatly depends on raising the Plants in Strength; which cannot be so well effected if the Weather should prove so bad after the Plants are come up, as that a sufficient Quantity of fresh Air cannot be admitted to them, therefore it is not advisable to be too early in sowing the Seeds.

When the Season is come, these Seeds may be sown on the upper Side of a Cucumber Bed, where there are any; and if there are none, a proper Quantity of new Horse Dung must be provided, which must be thrown in a Heap to ferment, and turned over, that it may acquire an equal Heat, in the same Manner as hath been directed for Cucumbers; and the Plants must be raised and managed in the same Manner as hath been directed for them, until they are planted where they are to remain, to which Article the Reader is desired to turn, to avoid Repetition.

The 2d Season for sowing these Seeds is about the Middle of *March*, and both these Sowings must be understood to be planted under Frames; for those which are designed for Bell or Hand Glasses, or to be covered with Oil Papers, should not be sown till about a Week in *April*; for when these are sown earlier, if the Plants are properly managed, they will grow so long, as to extend their Shoots to the Sides of the Glasses, before it will be safe to let them run out, for it often happens in this Country, that we have sharp Morning Frosts in the Middle of *May*; so that if the Ends of these Vines are then without the Glasses, if they are not covered with Mats, to guard them against the Frost, they will be in Danger of suffering greatly therefrom; and on the other Hand, if the Plants have spread so much as to fill the Glasses, and are not permitted to run out, they will be in equal Danger of suffering by their Confinement from the Heat of the Sun in the Day Time; therefore it is, that I should advise sowing the Seed rather a little later for the Glasses, than those which are to be covered with Oil Papers. Nor will the Times here mentioned be found too late, for I have put the Seeds of *Cantaleupe* Melons into a hot Bed the third of *May*, which were not transplanted, but remained where they were sown, and covered with oiled Paper; and from this Bed I cut a large Crop of good Fruit, which ripened about the latter End of *August*, and continued till the End of *October*. This I only mention, to shew what has and may be done, though it must not be always depended on.

But we next come to the making and preparing the Beds, or, as the Gardeners term it, the Ridges, into which

which the Plants are to be put out to remain; these should always be placed in a warm Situation, where they may be defended from all cold and strong Winds, for the East and North Winds are generally very troublesome in the Spring of the Year; so that if the Place be exposed to those Aspects, it will be difficult to admit a proper Share of fresh Air to the young Plants; and if it is much exposed to the South-west Winds, which often are very boisterous in Summer and Autumn; these will turn up and displace the Vines, whereby they will suffer greatly; therefore the best Position for these Beds is, where they are open to the South, or a little inclining to the East, and sheltered at a Distance by Trees from the other Points: This place should be inclosed with a good Reed Fence, which is better for this Purpose than any other Inclosure, because the Winds are deadened by the Reeds, and are not reverberated back again, as they are by Walls, pales, or other close Fences; but in making the Inclosure, it should be extended to such Distance every Way from the Beds, as not to obstruct the Sun's Rays during any Part of the Day; this should have a Door wide enough to admit of Wheelbarrows passing, to carry in Dung, Earth, &c. and it should be kept locked, that no Persons should be allowed to go in, but those who have Business; for ignorant Persons, having often Curiosity to look into the Beds, open the Glasses and let the cold Air to the Plants, and frequently leave the Glasses in part open; or sometimes when they are raised by the Gardener to admit the fresh Air, the Tilts are thrown down, so that the Air is excluded; all which are very injurious to the young Plants, as is also handling the Fruit after it is set; therefore none should be admitted, but when the Person who is intrusted with the Care of them is there.

The next Thing is the Preparation of the Earth for these Plants, in which the Dutch and German Gardeners are very exact: The Mixture which they generally prepare is of the following Sorts; of Hazel Loam, one third Part; of the scouring of Ditches or Ponds a third Part, and of very rotten Dung a third Part; these are mixed up at least one, and often two Years before they make use of it, frequently turning it over, to incorporate their Parts and sweeten it; but the Compost in which I find these Plants succeed best in England, is two Thirds of fresh gentle Loam, and one Third of rotten Neats Dung; if these are mixed together one Year before it is wanted, so as to have the Benefit of a Winter's Frost and Summer's Heat, observing to turn it over often, and never suffer Weeds to grow upon it, this will be found equal to any other Compost whatever.

As these Plants succeed best when they are planted young, so before the Plants appear, there should be a Quantity of new Dung thrown in a Heap, proportionable to the Number of Lights intended, allowing about fifteen good Wheelbarrows full to each Light; this must be two or three Times turned over, to prepare it (as hath been directed for Cucumbers) and in a Fortnight it will be fit for Use, at which Time the Trench must be dug to receive the Dung, where the Bed is intended; this must be made rather wider than the Frames, and in Length proportional to the Number of Frames intended. As to the Depth, that must be according as the Soil is dry or wet; but in a dry Ground it should not be less than a

Foot, or a Foot and a half deep; for the lower these Beds are made, the better they will succeed, where there is no Danger of their suffering by Wet. In the well laying and mixing of the Dung, the same Care must be taken, as hath been advised already for Cucumbers, which in every Respect must be the same for these Beds. When the Bed is made, the Frames should be placed over it to keep out Wet; but there should be no Earth laid upon it, till after it has been three or four Days made, and is found of a proper Temperature of Heat; for many Times these Beds will heat so violently when they are first made, as to burn the Earth, if covered with it; and when this happens, it is much the best Way to take this Earth off again; for the Plants will never thrive in it.

As soon as the Bed is found to be of a proper Warmth, the Earth should be laid upon it, which at first need not be more than two Inches thick, except in the Middle of each Light, where the Plants are to be placed, where there must be raised a Hill, fifteen Inches high or more, terminating in a flat Cone; in two or three Days after the Earth is put on the Bed, it will be of a proper Temperature to receive the Plants; then in the Evening you may transplant the Plants, but always do it when there is little Wind stirring: In taking up the Plants, their Roots should be carefully raised with a Trowel, so as to preserve all their Fibres; for if these are broken off, the Plants do not recover this; or if they do, they are generally weaker, and never make so good Vines as those which are more carefully removed; for these Plants are more nice and tender in transplanting than those of Cucumber, especially the *Cantaloupe* Melon; which, if it is not planted out, soon after the third (or what the Gardeners call the rough) Leaf is put out, they are long recovering their Vigour; so that when it happens, that the Beds cannot be ready for them in Time, it will be a good Method to plant each Plant into a small Pot while they are young, and these may be plunged into the hot Bed where they were raised, or in a Cucumber Bed where there is Room, so that they may be brought forward; and when the Bed is ready, these may be turned out of the Pots, with the whole Ball of Earth to their Roots, whereby they will receive no Check in removing: And this latter Method is what I should prefer to any other for the *Cantaloupe*, because there should never be more than one Plant left to grow in each Light; therefore in this Method there will be no Necessity of planting more, as there will be no Danger of their succeeding, whereas in the common Way, most People plant two or more Plants in each Light, for Fear some should miscarry when the Plants are placed on the Top of the Hills, they should be gently watered, which should be repeated once or twice after till they have taken good Fruit, after which they seldom require more; for when they receive too much Wet, they often canker at the Root, and when that happens they never produce good Fruit. When the Plants have established themselves well in the new Beds, there should be a greater Quantity of Earth laid on the Bed, beginning round the Hills where the Plants grow, that their Roots may have Room to strike out; and as the Earth is put in from Time to Time, it must be trodden or pressed down as close as possible, and it should be raised at least a Foot and a Half thick upon the Dung all over the Bed, observing

also to raise the Frames, that the Glasses may not be too near the Plants, lest the Sun should scorch them.

When the Plants have got four Leaves, the Top of the Plants should be pinched off with the Finger and Thumb, but not bruised or cut with a Knife, because in either of these Cases the Wound will not so soon heal over: This pinching is to cause the Plants to put out lateral Branches, for these are what will produce the Fruit; therefore when there are two or more of these lateral Shoots produced, they must also be pinched, to force out more; and this must be practised often, that there may be a Supply of what the Gardeners call Runners, to cover the Bed. The Management of these Beds must be nearly the same as hath been directed for the Cucumbers, therefore I need not repeat it here; but shall only observe, that the Melons require a greater Share of Air than Cucumbers, and very little Water; and when it is given to them, it should be at a Distance from their Stems.

If the Plants have succeeded well, they will spread over the Bed and reach to the Frames, in about five or six Weeks, at which Time the Alleys between the Beds should be dug out; or where there is but one Bed, there should be a Trench made on each Side, of about four Feet wide, as low as the Bottom of the Bed; and hot Dung wheeled in, to raise a Lining to the same Height as the Dung of the Bed, which should be trodden down close, and afterward covered with the same Earth as was laid upon the Bed, to the Thickness of a Foot and a Half or more, treading it down as close as possible; this will add to the Width of the Bed, so much as to make it in the whole twelve Feet broad, which is absolutely necessary, for the Roots of the Plants will extend themselves quite through it; and it is for Want of this Precaution, that it is common to see the Vines of Melons decay, before the Fruit is well grown; for where there is no Addition made to the Width of the Bed, the Roots will have reached the Sides of the Beds by the Time that the Fruit appears, and having no more Room to extend themselves, their Extremities are dried by the Sun and Air, which is soon discovered by the Plants hanging their Leaves in the Heat of the Day, this is soon attended with a Decay of many of those Leaves, which are near the Stem, and the Plants from that Time gradually languish, so that the Fruit cannot be supplied with Nourishment; but when ripe, will be found to have little Flesh, and that mealy and ill flavoured; whereas those Plants which have sufficient Breadth for the Roots to run, and the Earth laid of a proper Depth and closely trod down, will remain in Vigour until the Frost destroys them; so that I have had a second Crop of Fruit on them, which have sometimes ripened well; but all the first were excellent, and of a larger Size than these Sorts usually grow: The Leaves of these Plants were very large, and of a strong green, so that they were in the utmost Vigour; whereas, in most Places where the *Cantaloupe* Melons have been raised in *England*, the Beds have been no wider than they were first made, and perhaps not more than three Inches Thickness of Earth upon them, so that the Plants have decayed many Times without producing a single Fruit; and from thence People have imagined, that this Sort of Melon was too tender for this Climate, when their ill Success was entirely owing to their not understanding their Culture.

There is also another Advantage attending this Method of widening the Beds, as above directed, which is that of adding a fresh Warmth to the Beds, by the hot Dung which is buried on each Side, which will cause the Dung in the Bed to renew its Heat; and as the Plants will by this Time shew their Fruit, this additional Heat will be of great Service in setting the Fruit, especially if the Season should prove cold, as it often happens in this Country in the Month of *May*. When the Beds are made up in the Manner here directed, and the Vines have extended so far as to fill the Frames, and want more Room, the Frames should be raised up with Bricks about three Inches high, to admit the Shoots of the Vines to run out from under them; for if the Plants are strong, they will extend six or seven Feet each Way from their Stems; for which Reason, I caution every one to allow them Room, and to put but one Plant in each Light; for when the Vines are crowded, the Fruit seldom set well, but will drop off when they are as large as an Egg; therefore the Frames which are designed for Melons should not be made small, for the wider these are, the better will the Plants thrive, and produce a greater Plenty of Fruit.

There is no Part of Gardening, in which the Practitioners of this Art differ more, than in pruning and managing these Plants; nor are there any Rules laid down in the several Books in which the Culture of Melons has been treated of, by which any Person can be instructed; for there is such Inconsistency in all their Directions, and what is worse, the greatest Part of them are absurd, so that whoever follows them can never hope to succeed; therefore I shall, in as few Words as possible, give such plain Directions, as I hope will be sufficient to instruct any Person, who is the least conversant in these Things.

I have before advised the pinching off the Ends of the Plants as soon as they have a Joint, in order to get lateral Shoots, which are by the Gardeners called Runners; and when these Shoots have two or three Joints, to pinch off their Tops, to force out more Runners, because it is from these that the Fruit is to be produced; but after a sufficient Number are put out, they should not be stopped again, but wait for the Appearance of the Fruit, which will soon come out in Plenty; at which Time the Vines should be carefully looked over three Times a Week, to observe the Fruit, and make Choice of one upon each Runner, which is situated nearest the Stem, having the largest Foot Stalk, and that appears to be the strongest Fruit, and then pinch off all the other Fruit which may appear upon the same Runner; also pinch off the End of the Runner at the third Joint above the Fruit, and if the Runner is gently pinched at the next Joint above the Fruit, it will stop the Sap and set the Fruit. There is also another Method practised by some Gardeners to set this Fruit, which is the taking off some of the male Flowers, whose Farina is just ripe and fit for the Purpose, laying them over the female Flowers, which are situated on the Crown of the young Fruit, and with their Nails gently strike the male Flowers to shake the Farina into the female Flowers, whereby they are impregnated, and the Fruit soon after will swell, and shew visible Signs of their being perfectly set; so that where the Plants are under Frames, and the Wind excluded from them, which is necessary to convey the Farina from the

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the male to the female Flowers, this Practice may be very necessary. The taking off all the other Fruit will prevent the Nourishment being drawn away from the Fruit intended to grow, which if they were all left on the Plant, could not supply them with sufficient Nourishment; so that when they come to be as large as the End of a Man's Thumb, they all drop off, and scarce one of them sets, which will be prevented by the Method before directed: But there are some Persons, who are so covetous of having a Number of Fruit, as not to suffer any to be taken off, whereby they generally fail in their Expectation. My allowing but one Fruit to be left upon each Runner is, because if half of these stand, there will be full as many Fruit as the Plant can nourish; for if there are more than eight upon one Plant, the Fruit will be small and not so well nourished; indeed I have sometimes seen fifteen or twenty Melons upon one Plant, but these have generally been of the smaller Kinds, which do not require so much Nourishment as the *Cantaleupes*, whose Skins are of a thick Substance; so that where a greater Number are left of them, than the Plants can well supply, their Flesh will be remarkably thin.

As I before advised the stopping or pinching off the Runners three Joins above the Fruit, so by this there will be fresh Runners produced a little below the Places where the others were pinched; therefore it is, that I advise the careful looking over the Vines so often, to stop these new Runners soon after they come out, as also to pull off the young Fruit which will appear; and this must be repeated as often as it is found necessary, which will be until those intended to stand are grown so large as to draw all the Nourishment which the Plants can supply, for then the Plants will begin to abate of their Vigour. These few Directions, if properly made Use of, is all the pruning they require; but at the same Time when this is practised, it may be necessary to give some Water to the Plants, but at a Distance from their Stems; which will be of Service to set the Fruit and cause it to swell, but this must be done with great Caution.

The Glasses of the hot Bed should also be raised high, to admit a large Share of Air to the Plants, otherwise the Fruit will not set; and if the Season should prove very warm, the Glasses may be frequently drawn off, especially in an Evening, to receive the Dews, provided there is little Wind stirring; but they should not remain off the whole Night, lest the Cold should prove too great.

When the Plants have extended themselves from under the Frames, if the Weather should alter to Cold, it will be necessary to cover their Extremities every Night with Mats; for if these Shoots are injured, it will retard the Growth of the Fruit, and often proves very injurious to the Plants: And now what Water is given to the Plants, should be in the Alleys between the Beds; for as the Roots of the Vines will by this Time have extended themselves through the Alleys, so when the Ground there is well moistened, the Plants will receive the Benefit of it; and by this Method, the Stems of the Plants will be preserved dry, whereby they will continue sound; but these Waterings should not be repeated oftener than once a Week in dry warm Weather, and be sure to give as much Air as possible to the Plants, when the Season is warm.

Having given full Instructions for the Management of

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those Melons which are raised under Frames, I shall next proceed to treat of those which are raised under Bell or Hand Glasses. The Plants for these must be raised in the same Manner as hath been already directed, and about the latter End of *April*, if the Season proves forward, will be a good Time to make the Beds; therefore a sufficient Quantity of hot Dung should be provided, in Proportion to the intended Number of Glasses, allowing 8 or 9 good Wheelbarrows of Dung to each Glass. Where there is but one Bed, which is proposed to be extended in Length, the Trench should be dug out three Feet and a Half wide, and the Length according to the Number of Glasses, which should not be placed nearer than 4 Feet to each other; for when the Plants are too near each other, the Vines will intermix, and fill the Bed so closely, as to prevent the Fruit from setting: In digging the Trench, it should be so situated, as to allow for the widening of the Bed 3 or 4 Feet on each Side; the Depth must be according as the Soil is dry or wet; but, as was before observed, if the Soil is so dry, that there is no Danger of the Beds being hurt by the Wet, the lower they are made in the Ground the better: In making the Beds the same Regard must be had to the well mixing and laying of the Dung, as was before directed; and after the Dung is laid, there should be a Hill of Earth raised, where each Plant is to stand, one Foot and a Half high; the other Part of the Bed need not as yet be covered more than four Inches thick, which will be sufficient to keep the Warmth of the Dung from evaporating; then the Glasses should be placed over the Hills, and set down close, in order to warm the Earth of the Hills, to receive the Plants; and if the Beds work kindly, they will be in a proper Temperature to receive the Plants, in two or three Days after making; then the Plants should be removed in the same Manner as was before directed; and if they are in Pots, so that there will be no Danger of their growing, there should but one Plant be put under each Glass; and if they are not in Pots, there should be two, one of which may be afterward taken away, if they both grow. These Plants must be watered at first planting, to settle the Earth to their Roots, and shaded every Day, until they have taken new Root; and if the Nights prove cold, it will be proper to cover the Glasses with Mats, to preserve the Warmth of the Bed.

Where there are several Beds intended, they should be placed at 8 Feet Distance from each other, that there may be a proper Space left between them, to be afterward filled up, for the Roots of the Vines to have Room for extending themselves, for the Reasons before given.

When the Plants have taken good Root in the Beds, their Tops must be pinched off; and their pruning, &c. must, from Time to Time, be the same as for those under Frames: In the Day Time when the Weather is warm, the Glasses should be raised on the opposite Side to the Wind, to admit fresh Air to the Plants; for where this is not observed, they will draw up weak and sickly, therefore all possible Care should be taken, to prevent this; for if the Runners have not proper Strength, they can never supply the Fruit with Nourishment.

When the Plants are grown so long as to reach the Sides of the Glasses, if the Weather proves favourable, the Glasses must be set up on three Bricks, so as to raise them

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them about two Inches from the Surface of the Beds, to give Room for the Vines to run out from under them; but when this is done, the Beds should be covered all over with Earth to the Depth of one Foot and a Half, and trod down as close as possible; and if the Nights should prove cold, there should be a Covering of Mats put over the Beds, to prevent the Cold from injuring the tender Shoots of the Vines; but as the Vines of the *Cantaloupe* Melons are impatient of Wet, it will be necessary to arch the Beds over with Hoops, to support the Mats, that they may be ready for covering at all Times when they require it; which is the only sure Method to have these Melons succeed in *England*, where the Weather is so very uncertain and variable; for I have had some Beds of these Melons in as fine Order under these Glasses as could be desired, which were totally destroyed by one Day's heavy Rain in *June*.

After the Thickness of Earth is laid on the Beds, if the Weather should prove cold, it will be advisable to dig Trenches on each Side of the Beds, into which you should lay a sufficient Quantity of hot Dung, to make it of the same Thickness with the Bed, after the Manner before directed for the Frames; or if there is a sufficient Quantity of hot Dung ready, the whole Space between the Beds may be dug out, and filled up with the Dung, laying thereon the Earth a Foot and a Half deep, treading it down close: This new Dung will add a fresh Warmth to the Beds, and cause the Plants to shew Fruit soon after.

The Watering of these Plants must be done with great Caution, and not given to their Stems; the pinching of the Runners must be duly attended to, as also the pulling off all superfluous Fruit, to encourage those which are designed to remain; and in short, every Thing before directed for those under Frames, must likewise be observed for these; the further Care is, to cover them in all hard Rains and cold Nights, with Mats; which, if performed with Care, there will be little Danger of their miscarrying, and these Vines will remain vigorous until the Cold in Autumn destroys them.

There have been many Persons, who of late Years have raised their Melons under oiled Paper, and in many Places they have succeeded well; but where this is practised, there must be great Care taken not to keep these Coverings too close over them; for where that is done, the Vines will draw very weak, and rarely set their Fruit in any Plenty; therefore, where these Coverings are proposed to be used, I should advise to bring up the Plants under Hand or Bell Glasses, in the Manner before directed, until they are grown far enough to be let out from under the Glasses; and then, instead of the Covering with Mats, to put over the oiled Paper; and if this Covering is prudently managed, it will be the best that can be used. The best Sort of Paper for this Purpose is that which is strong, and not of too dark Colour; and it should be done over with Linseed Oil, which will dry soon. There should be a proportionable Number of the Sheets of this Paper pasted together, as will spread to the Dimensions of the Frame to which it is to be fastened; and if this is fixed to the Frame, before the Oil is rubbed over, so much the better; but this should be done so long before they are used, that the Oil may be

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thoroughly dry, and the Stench gone off, otherwise it will destroy the Plants.

Some make these Frames of broad Hoops, in Imitation of the Covers of Waggon; but as these are cumbersome to move, and there are no Conveniences for admitting Air to the Plants, but by raising the whole Frame on one Side, I prefer those made of Pantile Laths, framed like the Ridge of a House; and each Slope having Hinges, may be raised at Pleasure to admit the Air to the Plants; but as Descriptions of these Things are not well comprehended by Persons not so conversant with them, I shall exhibit a Figure of one of these Frames, to be added to the Article of *Stoves*.

The further Management of Melons, after their Fruit is set, is to keep pulling off all superfluous Fruit, and to pinch off all weak Runners, which may draw away Part of the Nourishment from the Fruit; also to turn the Fruit gently twice a Week, that each Side may have equal Benefit of the Sun and Air; for when they are suffered to lie with the same Side constantly to the Ground, that Side will become of a pale or whitish Colour, as if it were blanched, for want of the Advantages of Sun and Air. The Plants will require a little Water in very dry Weather, but this should be given them in the Alleys, at a Distance from the Stems of the Plants, and not oftner than once in a Week or ten Days, at which Times the Ground should be well soaked in the Alleys. This will encourage the Growth of Fruit, and cause the Flesh to be thick; but the great Caution necessary to be observed, is not to over water the Plants, which is certain Injury to them: Also be sure to give as much free Air as possible, at all Times, when the Weather will permit; this is absolutely necessary to render the Fruit good.

When the Fruit is fully grown, they must be duly watched to cut them at a proper Time; for if they are left a few Hours too long on the Vines, they will lose much of their Delicacy, therefore they should be looked over at least twice every Day; and if those Fruit which are intended for the Table, are cut early in the Morning, before the Sun has warmed them, they will be much better flavoured; but if any should require to be cut afterward, they should be put into cold Spring Water, or Ice, to cool them, before they are brought to Table; and those cut in the Morning, should be kept in the coolest Place till they are served up. The Sign of this Fruit's Maturity is, its beginning to crack near the Foot Stalk, and its beginning to smell, which never fail; for as the *Cantaloupe* Melons seldom change their Colour until they are too ripe, that should never be waited for.

The Directions here given for the Management of the *Cantaloupe* Melons, will be found equally good for all the other Sorts, as I have fully experienced; for in the common Method of managing them where the Earth is laid but three or four Inches thick, the Plants are very apt to decay before the Fruit is ripe; for their Roots soon reach to the Dung, and are extended to the Sides of the Bed, where their tender Fibres are exposed to the Air and Sun, which causes the Leaves of the Plants to hang down in the Heat of the Day, so it is necessary to shade the Plants with Mats, to prevent their Decay; and this also occasions the Watering of the Plants often to keep them alive, which is also prejudicial to their Roots; whereas when the Beds are made of a proper

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Width, and earthed of a sufficient Thickness, the Plants will bear the strongest Heat of the Sun in this Climate, without shewing the least Want of Moisture, or their Leaves drooping, and they will continue in Health till the Autumn Cold destroys them.

In saving the Seeds, I need not repeat here, that only such should be regarded, which are taken from the firmest Fruit, and those which have the highest Flavour; and if these are taken out with the Pulp entire, without displacing the Seeds, and suffered to remain in the Pulp two or three Days before it is washed out, the better; and then to preserve only the heavy Seeds, which sink in the Water.

MELOCACTUS.

MELOCARDUUS. } See Cactus.

MELOCHIA. See Corchorus.

MELON. See Melo.

MELONGENA. Tourn. Inst. R. H. 151. Tab. 65. Solanum. Lin. Gen. Plant. 224. Mad Apple, by some called Egg Plant; in French, Mayenne.

The Characters are,

The Flower has a permanent Empalement of one Leaf, deeply cut into 5 acute Segments, which spread open. The Flower hath but one Petal, which is cut into 5 Parts, which spread open and are reflexed. It hath 5 Awl-shaped Stamina, terminated by oblong Summits which converge together. In the Center is situated an oblong Germen supporting a slender Style crowned by an obtuse Stigma; the Germen becomes an oval or oblong Fruit with one Cell, which hath a fleshy Pulp, filled with compressed roundish Seeds.

The Species are,

1. MELONGENA caule inermi herbaceo, foliis oblongo-ovatis tomentosis integris, fructu ovato. Mad Apple with a smooth herbaceous Stalk, oblong, oval, woolly Leaves, which are entire, and an oval Fruit. This is the *Melongena fructu oblongo violaceo*. Tourn. Inst. 151. Mad Apple with an oblong, Violet coloured Fruit.

2. MELONGENA caule inermi herbaceo, foliis oblongo-ovatis tomentosis, fructu tereti. Mad Apple with an herbaceous smooth Stalk, oblong, oval, woolly Leaves, and a taper Fruit. This is the *Melongena fructu tereti violaceo*. Tourn. Inst. 151. Mad Apple with a taper, Violet coloured Fruit.

3. MELONGENA caule inermi herbaceo, foliis oblongis sinuatis tomentosis, fructu incurvo. Mad Apple with a smooth herbaceous Stalk, oblong sinuated Leaves which are woolly, and an incurved Fruit. This is the *Melongena fructu incurvo*. Tourn. Inst. R. H. 152. Mad Apple with an incurved Fruit.

4. MELONGENA spinosa, foliis sinuato-laciniatis, fructu tereti, caule herbaceo. Mad Apple with a prickly Stalk and Leaves, which are cut into Sinuses, a taper Fruit, and an herbaceous Stalk. This is the *Solanum pomiferum fructu spinoso*. J. B. 3. 619. Apple-bearing Nightshade with a prickly Fruit.

The 1st Sort grows naturally in Asia, Africa, and America, where the Fruit is commonly eaten by the Inhabitants; and it is cultivated in the Gardens in Spain as an esculent Fruit, by the Title of *Barenkeena*; the Turks who also eat the Fruit, call it *Badinjan*, the Italians *Melanzana*, and the Inhabitants of the British Islands in America, *Brown Jobn*, or *Brown Jolly*. It is an annual Plant with an herbaceous Stalk, which be-

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comes a little ligneous, and rises near 3 Feet high, sending out many Side Branches, garnished with oblong oval Leaves, 7 or 8 Inches long, and 4 broad; they are woolly, and their Borders are very slightly sinuated, but not indented, standing without Order upon very thick Foot Stalks. The Flowers come out singly from the Side of the Branches, having a thick fleshy Empalement of one Leaf, which is deeply cut into 5 acute Segments, which spread open, and are armed with strong Prickles on the Outside. The Flowers have one Petal, which is cut at the Brim into five Segments, which expand in Form of a Star, and are a little reflexed; they are blue, and the Summits which are connected together in the Bosom of the Flower are yellow. The Flowers are succeeded by oval fleshy Fruit, about the Size and Shape of a Swan's Egg, of a dark purple on one Side, and white on the other. The Flowers come out in June and July, and the Fruit ripens in September.

There are the following Varieties of this Species; one with white Fruit, called by some the Egg Plant; one with yellow Fruit, and another with pale red Fruit; all these Varieties are generally constant, the Seeds producing the same Fruit as those from which they were taken, but as they only differ in Colour, so I choose not to enumerate them as distinct Species.

The 2d Sort differs from the first in the Shape of the Fruit, which is commonly 8 or 9 Inches long, taper and strait; in other Respects they are the same, but as this never varies, when propagated in Gardens, so there can be no doubt of their being distinct Species. There are two Varieties of this Sort, one with a purplish Fruit, and the other white, but the latter is the most common in England.

The 3d Sort differs from the two former in the Shape of the Leaves, which are deeply sinuated on their Borders. The Fruit is oblong and incurved, of a yellowish Colour, and larger at the End than in any other Part.

The Seeds of the 4th Sort were sent me from India; this differs greatly from either of the former. The Stalks and Leaves are armed with very strong Thorns, and the Leaves are larger, and deeply jagged on their Sides. The Flowers are larger, and of a deeper blue Colour. The Fruit is long, taper, and white.

These Fruit are eaten by the Inhabitants of the warm Parts of the Globe, and are esteemed a Delicacy, but are supposed to have a Property of provoking Lust.

They are propagated by Seeds, sown on a moderate hot Bed in March, and when the Plants come up, they must be transplanted into another hot Bed about 4 Inches asunder, observing to water and shade them until they have taken Root; after which you must give them a great Share of Air when the Weather is warm, otherwise they will draw up very weak. They must also be frequently watered, without which they will make but very indifferent Progreß; but when they are grown so strong as to fill the Frame (which will be by the Middle, or End of May,) you must transplant them out into a rich Spot of Ground, at two Feet Distance, or in the Borders of the Pleasure Garden at the same Distance from other Plants, observing to preserve as much Earth to the Roots as possible when you take them up, otherwise they are subject to miscarry. Water them plentifully until they have taken Root, after which they will require but very little Care,

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Care, more than to keep them clear from Weeds, and in very dry Weather to give them some Water.

About the Middle of July the Fruit will appear, at which Time, if the Weather be very dry, you must often water them, which will cause the Fruit to grow very large, and increase their Number; toward the latter End of August their Fruit will ripen, when you must preserve the Seeds of each Kind separate.

These Plants are only preserved as Curiosities in England, the Fruit being seldom eaten in this Country, except by some *Italians* or *Spaniards*, who have been accustomed to eat them in their own Countries.

MELOPEPO. See Cucurbita.

MELONRY, or MELON GROUND, is an Apartment in the Kitchen Garden for the Propagation of Melons.

The Spot of Ground should be open to the South East Sun, but sheltered from the West, North West, and North East Winds, by Walls, Pales, or Hedges; it should also be upon a dry Soil, for nothing is more injurious to these Plants than much Wet; in Spring it often proves very wet Weather, when, if the Soil be very wet, there will be no making the Ridges until it is very late. You should also contrive to place it as near to the Dung as possible, which will save a great Deal of Labour in wheeling it in, and, if you can have a Pond of Water near it, in very dry Weather it will be very useful to water the Melons when necessary.

The Size of the Ground, must be proportioned to the Quantity of Ridges intended, which you may easily calculate, by allowing 12 Feet Breadth for every Ridge, and the Holes placed at about 4 Feet asunder, but it is the best Way to allow Room enough where you are not frightened for it.

This Ground should be inclosed with a Reed Fence, and kept constantly locked up during the Time the Melons are growing, for if they are exposed to every Person that walks in the Garden (most of whom have a Curiosity to handle the Vines, and look after the Fruit,) it will be of ill Consequence, nothing being more injurious to these Plants than frequent tumbling or disturbing their Leaves.

The common Practice in most Gardens is, to inclose a Spot of Ground either with Walls or Pales, which they constantly appropriate to this Purpose; but this is by no Means a good Method, for it rarely happens that these succeed well longer than two Years in the same Place, unless the Soil be removed, and fresh brought in, which is very expensive, therefore the best Way is, to have a sufficient Parcel of Reeds made into Pannels, which may be annually moved from Place to Place, so that you need not continue your Ridges longer than one Year in the same Place; and if you have a Piece of Ground which is large enough to divide into three or four such Places, the Fence may be every Year removed till the Whole has been occupied, after which you may return to the Spot where you began, which, by that Time, will be as good as fresh Earth; thus, without much Trouble, you may remove them every Year, for as one of the Sides will remain unremoved every Time the Fence is carried forward, the Labour will not be so great as if it were wholly removed to some Distance,

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and these Reed Fences are much preferable to either Walls, or Pales.

MELOTHRIA. Lin. Gen. Plant. 48.

The Characters are,

The Empalement of the Flower is of one Leaf, Bell-shaped, and cut slightly at the Brim into 5 Parts, this rests upon the Embryo. The Flower is of one Leaf, Wheel-shaped, having a Tube the Length of the Empalement. In the Center of the Flower is situated the Pointal, supporting a cylindrical Style, attended by 3 conical Stamina, which are inserted in the Tube of the Flower, and extended to the same Length. The Pointal becomes an oval small Berry, having 3 Divisions, in which are lodged small flat Seeds.

We have but one Species of this Plant, viz.

MELOTHRIA. Lin. Hort. Cliff. 490 Small creeping Cucumber. This is the *Cucumis minima fructu ovali nigro laevi*. Sloan. Hist. vol. 1. p. 227. Smallest Cucumber with a smooth black oval Fruit.

This Plant grows wild in the Woods in Carolina, Virginia, and also in many of the Islands in America; it creeps upon the Ground, with slender Vines, having angular Leaves, somewhat resembling those of the Melon, but much smaller. These Vines strike out Roots at every Joint, which fasten themselves into the Ground, and thereby a larger Share of Nourishment is drawn to the Plants, by which Means their Stalks extend to a great Distance each Way, and closely cover the Ground. The Flowers are very small, in Shape like those of the Melon, and of a pale Sulphur Colour. The Fruit, in the West-Indies, grows to the Size of a Pea, of an oval Figure, and changes black when ripe; these are by the Inhabitants sometimes pickled when they are green.

In England the Fruit are much smaller, and are so hidden by the Leaves, as to render it difficult to find them. The Plants will not grow in the open Air here, but must be sown upon a hot Bed, and if they are permitted, will soon spread over the Surface of a large Bed, and when the Fruit is ripe, if they scatter their Seeds, they Plants will come up where the Earth happens to be used on a hot Bed again, and if they are supplied with Water, will require no farther Care. This Plant is in some Gardens preserved for Variety, but is of no Use.

MENISPERMUM. Tourn. Aët. R. Par. 1705. Lin. Gen. Plant. 413. Moonseed.

The Characters are,

The Flower has an erect spreading Empalement of six Leaves which are deciduous. It has six oblong oval Petals, which are obtuse and concave, and six very short Stamina, terminated by single Summits, which are shorter than the Petals, and three almost oval Germen, on the Top of the spreading Styles, crowned by obtuse indented Stigmas. The Germen afterward turn to three oval Berries with one Cell, each inclosing one Moon-shaped compressed Seed.

The Species are,

1. **MENISPERMUM foliis peltatis subrotundis angulatis.** Hort. Cliff. 140. Moonseed with Target-shaped roundish angular Leaves. This is the *Menispermum Canadense scandens, umbilicatis foliis*. Tourn. Aët. Par. 1705. Climbing Moonseed of Canada, with a Navel-shaped Leaf.

2. **MENISPERMUM foliis cordatis peltatis lobatis.** Flor. Virg. 40. Moonseed with Heart and Target shaped Leaves, which have lobes. This is the *Menispermum folio hederae*. Hort. Elth. Moonseed with an Ivy Leaf.

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3. *MENISPERMUM foliis cordatis subtus villosis*, Lin. Sp. Plant. 340. Moonseed with Heart-shaped Leaves, which are hairy on their under Side.

The 1st Sort grows naturally in *Canada, Virginia*, and most Parts of *North America*, in the Woods; this hath a thick ligneous Root, from which are sent out many climbing Stalks, which become ligneous, and rise 12 or 14 Feet high, twisting themselves about the neighbouring Plants for Support; these are garnished with large smooth roundish Leaves, whose Foot Stalks are placed almost in the Middle of the Leaves on the back Side, and on the upper Side there is a Hollow in that Part of the Leaf, resembling a Navel. The Flowers come out in loose Bunches, from the Side of the Stalks; they are of an herbaceous Colour, small, and composed of six oblong oval Petals, and six very short Stamina, terminated by single Summits; the three Germen situated in the Center, turn to so many channelled Berries, each containing one compressed Seed. It flowers in *July*, and the Seeds ripen in Autumn.

This Sort may be easily propagated by laying down the Branches, which if performed in Autumn, they will have made good Roots, by the following Autumn, when they may be separated from the old Plant, and transplanted where they are designed to remain; these Plants require Support, for their Branches are slender and weak. In the Country where it grows naturally, they climb up the Trees to a considerable Height, so that if these are planted near Trees in Wilderness Quarters, where their Stalks may have Support, they will thrive better than in an open Situation.

The 2d Sort differs from the first in the Shape of its Leaves, which are angular, and sometimes Heart-shaped, their Foot Stalks join to the Base of the Leaves, so they have no umbilical Mark on their Surface. The Stalks become ligneous, and rise nearly as high as those of the first Sort; the Flowers and Berries do not differ from them, and it is propagated the same way.

The 3d Sort grows naturally in *Carolina*, from whence the Seeds were sent to *England*; this has by some been supposed the same with the 2d Sort, from which it differs in its Roots, not becoming woody as those do. The Stalks are also herbaceous; the Leaves are entire and hairy, and are not more than half so large as those of the 2d, nor is the Plant so hardy, for, in severe Winters, those which are exposed to the open Air, are sometimes killed, whereas the second Sort is never injured by Cold. This Sort does not produce any Flowers in *England*, unless the Season proves very warm.

This may be propagated by parting the Roots, which spread out on every Side, so that Part of them may be cut off every other Year; the best Time for doing this is in Spring, a little before the Plants begin to shoot; these should be planted in a warm Situation, and a light Soil, for in strong Land, where the Wet is detained in Winter, the Roots are apt to rot, therefore if they are planted close to a Wall exposed to the South or West, their Stalks may be fastened against the Wall, to prevent their trailing on the Ground, and in this Situation the Plants will frequently flower, and by a little Shelter in severe Frost, their Stalks may be preserved from Injury.

There is little Beauty in these Plants, but yet they

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are preserved in many Gardens for the Sake of Variety, for which Reason they are here inserted.

MENTHA. Tourn. Inst. R. H. 188. Tab. 89. Lin. Gen. Plant. 633. Mint; in French, *Menthe*.

The Characters are,

It hath a Lip Flower of one Petal, sitting in a permanent tubulous Empalement of one Leaf, which is erect, and cut at the Brim into 5 equal Segments. The Tube of the Petal is a little longer than the Empalement. The Mouth is cut into 4 almost equal Segments, the upper being a little larger and indented. It hath 4 Awl-shaped Stamina, which are erect and distant, the two nearest being longest; they are terminated by roundish Summits, and in the Bottom of the Tube is situated a four-pointed Germen, supporting a slender erect Style, crowned by a bifid spreading Stigma. The Germen turns to 4 naked Seeds sitting in the Empalement.

The Species are,

1. *MENTHA floribus spicatis, foliis oblongis serratis*. Hort. Upsal. 168. Mint with spiked Flowers, and oblong sawed Leaves. This is the *Mentha angustifolia spicata*. C. B. P. 227. Narrow-leaved spiked Mint, commonly called Spear Mint.

2. *MENTHA floribus spicatis, foliis longioribus glabris, superne minime serratis*. Mint with spiked Flowers, and longer smooth Leaves, very slightly sawed toward their Points. This is the *Mentha angustifolia spicata glabra*. Rand. Narrow leaved smooth spiked Mint.

3. *MENTHA foliis lanceolatis serratis, subtus incanis, floribus spicatis hirsutissimis*. Mint with Spear-shaped sawed Leaves, hoary on their under Side, and very hairy spiked Flowers. This is the *Mentha sylvestris candicans, odore sativi*. Doody. Raii. Syn. App. Wild Mint of a white Colour, smelling like Garden Mint.

4. *MENTHA spicis confertis, foliis serratis tomentosis sessilibus*. Hort. Cliff. 306. Mint with Spikes of Flowers growing together, and woolly sawed Leaves sitting close to the Stalks. This is the *Mentha sylvestris longiore folio*. C. B. P. 227. Wild Mint with a longer Leaf.

5. *MENTHA spicis crassioribus, foliis ovato-lanceolatis serratis subtus tomentosis petiolatis*. Mint with thicker Spikes, and oval Spear-shaped sawed Leaves, woolly on their under Side, and have Foot Stalks. This is the *Mentha aquatica genus hirsutum, spicis latiore*. J. B. 3. 222. Hairy Water Mint with a broader Spike.

6. *MENTHA spicis crassioribus interruptis, foliis lanceolatis acutè serratis*. Mint with thicker Spikes of Flowers, which are interrupted, and Spear-shaped Leaves, sharply sawed. This is the *Mentha servida nigricans, piperis sapore*. Rand. Hort. Chess. Cat. Blackish hot Mint with a Taste like Pepper, commonly called, Pepper Mint.

7. *MENTHA floribus spicatis, foliis cordatis dentatis undulatis sessilibus*. Hort. Cliff. 306. Mint with spiked Flowers, and Heart-shaped indented Leaves, which are waved, and sit close to the Stalks. This is the *Mentha crispa Danica sive Germanica speciosa*. Mer. Hist. 3. p. 367. Danish, or German curled Mint.

8. *MENTHA spicis confertis, foliis ovatis rugosis sessilibus*. Mint with Spikes growing together, and oval rough Leaves, sitting close to the Stalk. This is the *Menthastrum folio rugoso rotundiore spontaneum, flore spicato, odore gravi*. J. B. Wild Mint with a rounder rough Leaf, and spiked Flower, having a strong Scent.

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9. *MENTHA spicis confertis interruptis, foliis oblongo-ovatis acuminatis dentatis sessilibus.* Mint with interrupted Spikes of Flowers growing together, and oblong, oval, acute-pointed, indented Leaves, sitting close to the Stalk. This is the *Mentha rotundifolia rubra, aurantii odore.* Mor. Hist. Round leaved red Mint, smelling like an Orange, commonly called, Orange Mint.

10. *MENTHA foliis oblongis dentatis, utrinque tomentosis sessilibus, spicis tenuioribus.* Mint with oblong indented Leaves, woolly on both Sides, set close to the Stalk, and very narrow Spikes of Flowers. This is the *Menthastrum chalcipense, angustifolium, raro florens.* Boerb. Narrow leaved wild Mint of Aleppo, which rarely flowers.

11. *MENTHA floribus capitatis, foliis ovatis serratis petiolatis, flaminibus corollâ longioribus.* Hort. Cliff. 306. Mint with Flowers growing in Heads, oval sawed Leaves having Foot Stalks, and Stamina longer than the Petals. This is the *Mentha rotundifolia palustris five aquatica major.* C. B. P. Greater round leaved Water Mint.

12. *MENTHA floribus capitatis, foliis lanceolatis serratis subpetiolatis.* Lin. Sp. Plant. 576. Mint with Flowers growing in Heads, and Spear-shaped sawed Leaves with very short Foot Stalks. This is the *Mentha serotina nigricans latifolia.* Rand. Broad leaved blackish hot Mint, or Pepper Mint.

13. *MENTHA floribus verticillatis, foliis ovatis acutis serratis, flaminibus corollâ brevioribus.* Lin. Sp. Plant. 577. Mint with Flowers growing in Whorls, oval acute sawed Leaves, and Stamina shorter than the Petals. This is the *Mentha arvensis, verticillata hirsuta.* J. B. 3. 2. Whorled hairy Field Mint, or Calamint of the Shops.

14. *MENTHA floribus verticillatis, foliis ovatis dentatis, flaminibus corollâ longioribus.* Mint with Flowers growing in Whorls, oval indented Leaves, and Stamina longer than the Petals. This is the *Mentha aquatica, exigua.* Trag. Lib. 1. c. 6. Smallest Water Mint.

15. *MENTHA floribus verticillatis, foliis ovatis, marginibus ciliatis, flaminibus corollam æquantibus.* Mint with whorled Flowers, oval Leaves whose Borders are hairy, and Stamina equaling the Petals. This is the *Mentha verticillata, rotundiore folio, odore ocymi.* Dale. Whorled Mint with a rounder Leaf, smelling like Basil.

16. *MENTHA floribus verticillatis, foliis ovatis serratis hirsutis, flaminibus corollâ longioribus.* Mint with whorled Flowers, oval sawed hairy Leaves, and Stamina longer than the Petals. This is the *Mentha aquatica five sisymbrium hirsutum.* J. B. 3. 2. 224. Water Mint, or hairy Sisymbrium.

17. *MENTHA verticillata, longiori acuminato folio, odore aromatico.* Rand. Hort. Chel. Cat. Whorled Mint with a longer acute-pointed Leaf, and an aromatick Scent.

18. *MENTHA floribus verticillatis, foliis oblongo-ovatis rugosis serratis, flaminibus corollâ longioribus.* Mint with whorled Flowers, oblong oval rough sawed Leaves, and Stamina longer than the Petals. This is the *Mentha crispâ verticillata, folio rotundiore.* J. B. Curled Mint, having whorled Flowers, and a rounder Leaf.

There are several Varieties of this Genus, which have been found growing naturally in England, of which I have ten or twelve in my own Collection; but as I suspect them to be only accidental Variations, arising from the different Soils and Situations where they have been found, I have not enumerated them here; those which

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are here mentioned, I take to be distinct Species, having cultivated them near thirty Years, in which Time I have not observed them to change from one to another; several of these I have propagated by Seeds, and have found them keep to the Kinds from which the Seeds were saved.

The first Sort is what the Gardeners cultivate to supply the Markets, and is used both as a culinary Herb, and for Medicine; it is generally called Spear Mint, and by some Heart Mint; Parkinson and Gerard title it Roman Mint; this is a Plant so well known, as to need no Description. There are two Varieties of this, one with a curled Leaf, and the other has variegated Leaves, but both these I have had run from the common Sort; these are by some preserved in Gardens for Variety, therefore I have mentioned them here.

This Herb is greatly esteemed for all Disorders of the Stomach, Loss of Appetite, and vomiting; there is a simple Water, a Spirit, a compound Syrup, and a distilled Oil of it prepared in the Shops.

The 2d Sort hath smoother Leaves than the first, and they are rather narrower, in other Respects it agrees with that, so that it is frequently cultivated in the Gardens for Use, without Distinction.

The 3d Sort grows naturally in England; the Leaves of this are shorter, and broader in the Middle than either of the former, the Serratures on their Edges are more acute, and their under Sides are woolly, and very white. The Stalks divide more toward the Top, so are terminated by a greater Number of Spikes, the lower Part of which are interrupted. The Scent of this Sort is very like that of the Garden Mint.

The 4th Sort hath longer and broader Leaves than either of the former, and are woolly and white. The Serratures on their Edges are farther asunder, and are very sharp pointed; they sit close to the Stalks, which are hairy. The Spikes of Flowers are slender, several growing together at the Top of the Stalk, which are hairy. This is the *Menthastrum*, or wild Mint of the Shops, and is an Ingredient in the *Trochisci de Myrrha.*

The 5th Sort grows naturally in moist Places in several Parts of England, it is titled Spiked Horse Mint, or Water Mint. The Stalks of this are shorter than those of either of the former, and are hairy, as are also the Leaves, which are oval, Spear-shaped, sawed on their Edges, and of a pale Colour. The Flowers grow in short thick Spikes at the Top of the Stalks, their Stamina being shorter than the Petal.

The 6th Sort is found growing naturally in some Parts of England; I have found it by the Side of the River between Mitcham and Croydon, in Surry; this hath smooth purple Stalks; the Leaves are smaller than those of common Mint; they are Spear-Shaped, sawed on their Edges, and of a darker green Colour than either of the former; their Mid-rib and Veins are purple, and a little hairy on their under Side. The Spikes of Flowers are shorter and thicker than those of the common Mint, and are broken, or interrupted at the Bottom; they are of a dark purple Colour, and their Stamina are longer than the Petal. The whole Plant has a hot biting Taste like Pepper, and a pleasant Scent. There is a distilled Water of this Plant kept in the Shops, which is by many preferred to that of the common Mint, for all the Purposes for which that

that is usually prescribed, and is esteemed an excellent Remedy against the Stone and Gravel.

The 7th Sort was originally brought from *Denmark*, where it was thought to grow naturally, but Dr. *Linnaeus* fixes it as a Native of *Siberia*. The Stalks of this Sort are hairy, and rise about the same Height with the common. The Leaves are Heart-shaped, deeply indented on their Edges, waved and curled, and sit close to the Stalk, they are of a light green. The Flowers are purple, growing in thick interrupted Spikes at the Top of the Stalks; their Empalements are cut almost to the Bottom, and the Style of the Flower is bifid, standing out beyond the Petal.

The 8th Sort grows naturally in many Parts of *England*; this rises with a strong four cornered hairy Stalk, about the same Height as the common Mint, branching out toward the Top, and garnished with oval rough Leaves sitting close to the Stalks; they are of a dark green, and crenated on their Edges. The Spikes of Flowers grow in Clusters at the Top of the Stalks, which are short and close; the Flowers are of an herbaceous white Colour, and their Stamina are stretched out beyond the Petal.

The 9th Sort is commonly called Orange Mint, from its Scent, which is somewhat like that of the Rind of Orange. This rises with an upright smooth Stalk as high as the common Mint, but does not branch out like that; the Leaves are much broader than those of the common Sort, the Indentures on their Edges are deep, and they end in acute Points. The Spikes of Flowers grow in Clusters on the Top of the Stalks, which are interrupted; they are of a pale Colour, and their Stamina are shorter than the Petal. It is commonly cultivated in Gardens for its pleasant Scent.

The 10th Sort grows naturally at *Aleppo*, but is hardy enough to thrive in the open Air in *England*. This hath slender four cornered Stalks purple at Bottom, but woolly upward, seldom branching; they are garnished with oblong indented Leaves, downy on both sides, sitting close to the Stalks. The Spikes of Flowers are single, and very slender; these do not often appear in *England*, but when they do it is late in the Summer. It creeps much at the Root, so the only Way to obtain Flowers, is to confine their Roots in Pots.

The 11th Sort grows naturally in Ditches in most Parts of *England*, and is commonly known by the Name of Water Mint. This hath hairy Stalks about a Foot high, which branch toward the Top, and are garnished with oval sawed Leaves, standing upon pretty long Foot Stalks. The Flowers grow in roundish Spikes at the End of the Branches, they are of a purple Colour, and their Stamina are longer than the Petal. The whole Plant has a very strong Scent, somewhat like that of Penny-Royal. This Sort is sometimes used in Medicine, and is reckoned hotter than the Garden Mint; it is carminative, expelling Wind out of the Stomach, and helping the Cholick.

The 12th Sort grows naturally in Ditches in several Parts of *England*; the Stalks are purple, smooth, and short, branching out on every Side; the Leaves are small, Spear-shaped, of a dark Colour; they are but slightly sawed on their Edges, and stand upon short Foot Stalks. The Flowers grow in roundish Heads on the Top of the

Stalks, they are purple, and their Stamina are longer than the Petal. This Sort has a warm biting Taste, not quite so hot as the Pepper Mint before described, but is often used for it. There is a Variety of this which smells like Penny-Royal.

The 13th Sort grows naturally in arable Land in most Parts of *England*, and is rarely admitted into Gardens. This is the Water Calamint of the Shops, but is now seldom used in Medicine. The Stalks of this Sort rise about a Foot high and are hairy, garnished with oval Leaves ending in acute Points, and sawed on their Edges. The Flowers grow in very thick Whorls round the Stalks; they are small, of a purple Colour, and their Stamina are shorter than the Petal. The Plant has a strong Scent like Penny-royal.

The 14th Sort grows in watery Places in many Parts of *England*; this hath weak trailing Stalks a Foot and a Half long, garnished with small oval Leaves which are indented on their Edges, and stand upon pretty long Foot Stalks. The Flowers grow in thick Whorls round the Stalks, they are purple, and their Stamina are longer than the Petal.

The 15th Sort grows plentifully on the Side of the Road between *Bocking* and *Gosfield* in *Essex*; the Stalks of this are much smaller, and not so long as those of the former; the Leaves are shorter and rounder, and are very little indented on their Edges, but have their Borders set with Hairs. The Whorls of Flowers are smaller, and the whole Plant has the Scent of *Basil*.

The 16th Sort grows naturally in Ditches and on the Sides of Rivers, in many Parts of *England*. This hath hairy four cornered Stalks, a Foot or more in Height; the Leaves are oval, sawed, and very hairy. The Flowers grow in large Whorls toward the Top of the Stalks; they are purple, and their Stamina are longer than the Petals. This hath a pleasanter Scent than the common Water Mint, so is called Sweet Water Mint, by Way of Distinction: It stands in the List of Simples in most Dispensaries. But is now seldom used in Medicine.

The 17th Sort grows naturally by the Side of the River *Medway*, between *Rocheester* and *Chatham*. This rises with slender hairy Stalks near two Feet high, garnished with Spear-shaped Leaves, ending in acute Points, which are sawed on their Edges; the Stalks are beset with Whorls of Flowers, almost their whole Length, they have frequently 10 or 12 Whorls on each. The Flowers are purplish, and their Stamina are equal with the Petals. This hath a very pleasant aromatick Scent.

The 18th Sort grows naturally in *Holland*, between *Leyden* and *Haerlam*. This hath purple smooth Stalks, which rise about the same Height as the common Mint, garnished with oblong oval Leaves, which are rough and sawed on their Edges, having very short Foot Stalks. The Flowers grow in Whorls toward the Top of the Stalks, under each of these are placed two very small Leaves, in which this differs from most of the other whorled Mints. The Flowers are of a bright purple, and their Stamina are longer than the Petal.

All the Sorts of Mint are easily propagated by parting the Roots in the Spring, or by planting Cuttings during any of the Summer Months, but they should have a moist Soil; and after the Cuttings are planted, if the Season should prove dry, they must be often watered, until they have taken Root; after which, they will require

no farther Care but to keep them clear from Weeds; they should be planted in Beds about four Feet wide, allowing a Path two Feet broad, to go between the Beds to water, weed, and cut the Plants. The Distance they should be set is about four or five Inches, or more, because they spread very much at their Roots; for which Reason, the Beds should not stand longer than three Years before you plant fresh, for by that Time the Roots will be mated so closely, as to rot and decay each other, if permitted to stand longer. There are some People who are very fond of Mint Sallad in Winter and Spring; in order to obtain which, they take up the Roots before *Christmas*, and plant them upon a moderate hot Bed pretty close, covering them with fine Earth about an Inch thick, and cover the Bed either with Matts, or Frames of Glass. In these Beds the Mint will come up in a Month's Time, and be soon fit to cut for that Purpose.

When the Herb is cut for medicinal Use, it should be done in very dry weather, just when it is in flower; for if it stand longer, it will not be near so handsome, nor so well tasted; if cut when it is wet, it will change black and be little worth; this should be hung up to dry in a shady Place, where it may remain for use.

If the Soil be good in which these Plants are set, they will afford three Crops every Year, but after *July* they seldom prove good; therefore what Shoots are produced after that Time, should be permitted to remain till *Michaelmas*, when they must be cut down close; and after clearing the Beds from Weeds, you should spread a little fine rich Earth all over them, which will greatly encourage the Roots against the succeeding Spring.

As the distilled Water of all the Sorts of Mint, is esteemed a very wholesome cordial Dram, so I should think it might be substituted instead of those vile Spirits, with which the common People intoxicate themselves; for the Pepper Mint Water is as warm on the Stomach as any Sort of Dram, and more so than any of those noxious Spirits; and if this was mixed with some other agreeable aromack Herbs, there might certainly be distilled a Liquor much more palatable and wholesome, than what is now vended in common; for as the Generality of the lower Clafs of People are so debauched, as not to be contented without Drams, so the less hurtful those are made, the better it will be for the Publick; and by introducing the distilling of Herbs, there will be less Occasion for using of Wheat.

MENTHA CATARIA. See *Nepeta*.

MENTZELIA. *Plum. Nov. Gen. Plant. 40. Tab. 6. Lin. Gen. Plant. 595.*

So called by Father *Plumier*, who discovered it in *America*, in Honour of Dr. *Mentzelius*, Physician to the Elector of *Brandenburg*, and who published an Index of Plants in *Latin*, *Greek*, and *High Dutch*.

The Characters are,

The Flower hath a spreading Empalement cut into five Parts, which sits upon a long cylindrical Germen. It hath five Petals which spread open, and are a little longer than the Empalement, and many erect bristly Stamina, terminated by single Summits. From the long cylindrical Germen which is situated under the Flower, arises a bristly Style the Length of the Petals, crowned by a single Stigma. The Germen afterward turns to a cylindrical long Capsule with one Cell, containing many small Seeds.

We know but one Species of this Genus, viz.

MENTZELIA. *Hort. Cliff. 492. Plumier* titles it *Mentzelia foliis & fructibus asperis. Nov. Gen. Plant. 41. Mentzelia* with prickly Leaves and Fruit.

This Plant grows plentifully at *La Vera Cruz*, from whence the Seeds were sent to *England* by Dr. *Houston*, which have succeeded in the Physick Garden at *Chelsea*.

This Plant is annual, it rises with a slender smooth Stalk, which is stiff, and becomes a little woody, rising more than 3 Feet high, branching out alternately at Distances; the Branches are distorted, and run into one another; these are garnished with Leaves shaped like the Point of a Halbert, standing alternately on the Branches, upon short Foot Stalks; they are covered with short hooked Prickles, which fasten themselves into the Clothes of those who rub against them; and those Parts of the Branches easily separate from the Plants, and adhere to the Clothes in like Manner as the Seeds of *Clivers*. The Flowers come out singly from the Joints of the Stalk, resting on a cylindrical Germen, which is near an Inch in Length, narrow at the Base, but widens upward to the Top. Upon the Top of it comes out the Empalement, which is spread open after the Manner of the *Onagra*; then the Petals of the Flower spread open upon the Empalement, they are of a pale yellow Colour, and longer than the Empalement. In the Middle arises a great Number of Stamina which are erect, and terminated by single Summits; from the Germen arises a single Style, as long as the Petals, crowned by a single Stigma. The Germen turns to a long cylindrical Capsule, armed with the like Prickles as the Leaves, which also fasten to the Clothes of those who rub against them; these have but one Cell, which is filled with small Seeds.

As this is an annual Plant, which perishes soon after the Seeds are ripe, therefore the Seeds must be sown on a hot Bed early in Spring, that the Plants may be brought forward early in the Season, otherwise they will not produce ripe Seed in this Country. When the Plants are come up about an Inch high, they should be each transplanted into a Halfpenny Pot filled with light rich Earth, and plunged into a hot Bed of Tanners Bark, being careful to shade them from the Sun until they have taken new Root; after which Time they must be constantly watered every other Day in warm Weather, and should have fresh Air every Day admitted to them, in Proportion to the Warmth of the Season, and the Heat of the Bed in which they are plunged. In about six Weeks or two Months after transplanting, if the Plants have made a good Progress, they will have filled the Pots with their Roots; when they should be shifted into larger Pots, which must be filled with light rich Earth, and then plunged into the Bark Bed in the Stove, that they may have Room to grow in Height; observing, as before, to water them duly, as also to admit fresh Air to them every Day in warm Weather. With this Management the Plants will rise three Feet High, and will produce ripe Seeds the latter End of *August* or the Beginning of *September*.

MENYANTHES, is the *Trifolium Palustre*, or Bog-Bean. This Plant is common upon boggy Places in divers Parts of *England*, but is never cultivated in Gardens; for which Reason I shall not trouble the Reader with any further Account of it, except the taking Notice, that

that this Plant is at present in great Esteem, being thought an excellent Remedy for the Rheumatism, Gout, and many other Disorders. It is frequently called Bog Bean, Or Marsh Trefoil in the Markets, and grows plentifully on Bogs, where it is gathered and brought to to supply the Markets.

MERCURIALIS. Tourn. Inst. Lin. Gen. Pl. 998. Mercury; in French *Mercuriale*.

The Characters are,

It is male and female in different Plants; the male Flowers have a spreading Empalement, which is cut into 3 concave Segments, these have no Petals, but have 9 or 12 erect hairy Stamina, crowned by globular Twin Summits. The female Flowers have no Petals, but have 2 Awl-shaped, acute-pointed Nectariums; to each of these there is a single broad Germen, impressed with a Furrow between them; these roundish compressed Germen have a prickly Furrow on each Side, and support two reflexed prickly Styles, crowned by acute reflexed Stigmas. The Germen turns to a Twin Capsule shaped like the Scrotum, having two Cells, each containing one roundish Seed.

The Species are,

1. MERCURIALIS caule brachiato, foliis glabris. Hort. Cliff. 461. Mercury with an armed Stalk and smooth Leaves. This is the *Mercurialis spicata* & testiculata mas & foemina. C. B. P. 121. Mercury with Spiked and testiculated Flowers, both male and female.

2. MERCURIALIS caule simplicissimo, foliis scabris. Hort. Cliff. 461. Mercury with a single stalk and rough Leaves. This is the *Mercurialis montana spicata* & testiculata. C. B. P. 122. Mountain Mercury, or Dog's Mercury, with Spiked and testiculated Flowers.

3. MERCURIALIS caule subfruticosa, foliis tomentosis. Hort. Cliff. Mercury with a Stalk somewhat shrubby and woolly Leaves. This is the *Mercurialis fruticosa incana, spicata* & testiculata. Tourn. Shrubby hoary Mercury, having spiked and testiculated Flowers.

The 1st Sort is commonly called French Mercury, from whence it might have been brought into England; for although it is now become a Weed in Gardens and upon Dung-hills, yet it is seldom found growing at a Distance from Habitations. This is an annual Plant, with a branching Stalk about a Foot high, garnished with Spear-shaped Leaves about an Inch and a Half long, indented on their Edges, of a pale or yellowish green Colour. The male Plants have Spikes of herbaceous Flowers, growing on the Top of the Stalks, these fall off soon; but the female Plants, which have testiculated Flowers proceeding from the Side of the Stalks, are succeeded by Seeds, which, if permitted to scatter, will produce Plenty of Plants of both Sexes. The Leaves and Stalks of this Plant are used in Medicine, and are reckoned aperitive and mollifying.

The 2d Sort grows under Hedges and in Woods, in moist Parts of England. This hath a perennial Root which creeps in the Ground; the Stalks are single and without Branches, rising 10 or 12 Inches high, garnished with rough Leaves, placed by Pairs at each Joint; they are of a dark green Colour, and indented on their Edges; these have their male Flowers growing in Spikes on different Plants, from those which produce Seeds.

This hath a poisonous Quality, there have been many late Instances of it, where People in the Spring of the

Year, when there has been a Scarcity of Greens, have boiled the Leaves and suffered greatly by eating them.

The 3d Sort grows naturally in the South of France, in Spain, and Italy. This rises with a shrubby branching Stalk a Foot and a Half high, garnished with oval Leaves placed by Pairs, covered with a white Down on both Sides. The male Flowers grow in short Spikes from the Side of the Stalks, upon different Plants from the Fruit, which are testiculated and hoary. If the Seeds of these are permitted to scatter, the Plants will come up the following Spring; and if the Seeds are sown, it should be performed in Autumn, for those which are sown in Spring, never grow the same Year. This Plant should have a warm Situation and a dry rubbishy Soil, in which it will live three or four Years, but in hard Frost is frequently killed.

MESEMBRYANTHEMUM. Dill. Gen. 9. Hort. Elth. 179. Ficoides. Tourn. Ach. Fig Marygold.

The Characters are,

The Flower hath a permanent spreading Empalement of one Leaf, which is cut at the Top into 5 acute Parts. It hath one Petal, which is cut into many linear Segments almost to the Bottom, and ranged in several Series, but are joined together at their Base; within these are ranged a great Number of hairy Stamina, terminated by incumbent Summits. Under the Flower is situated an obtuse five cornered Germen, supporting sometimes 5, and often 10 or more Styles, which are reflexed and crowned by single Stigmas. The Germen becomes a roundish fleshy Fruit, having as many Cells as there are Styles, filled with small Seeds.

The Species are,

1. MESEMBRYANTHEMUM foliis alternis teretiusculis obtusis ciliatis. Hort. Up. *Mesembryanthemum* with taper, obtuse, hairy Leaves, placed alternately. This is the *Ficoides Neapolitana, flore candida*. H. L. Fig Marygold of Naples with a white Flower, or Egyptian Kali.

2. MESEMBRYANTHEMUM foliis alternis ovatis obtusis undulatis. Hort. Cliff. 216. *Mesembryanthemum* with oval obtuse, waved Leaves placed alternately. This is the *Ficoides Africana, folio plantaginis undulato, micis argenteis adpersa*. Tourn. Ach. R. Par. 1705. African Fig Marygold with a waved Plantain Leaf, marked with silvery Spots, commonly called the Diamond *Ficoides*, Diamond Plant, or Ice Plant.

3. MESEMBRYANTHEMUM foliis semiteretibus, floribus sessilibus axillaribus. Lin. Sp. Pl. 481. *Mesembryanthemum* with half taper Leaves, and Flowers sitting close to the Wings of the Stalks. This is the *Ficoides Capense, folio tereti, flore albido*. Pet. Gaz. 78. Fig Marygold of the Cape, with a taper Leaf and whitish Flower.

4. MESEMBRYANTHEMUM foliis semicylindraceis, floribus quadrifidis. Lin. Sp. Plant. 481. *Mesembryanthemum* with half cylindrical Leaves, and quadrifid Flowers. This is the *Ficoides Africana, cresta, arborescens, lignosa, flore radiato, primo purpureo, dein argenteo, interdum clauso; noctu aperto*. Boerb. Ind. alt. 1. 290. Upright, ligneous Tree Fig Marygold of Africa, with a radiated Flower, which is at first purple, afterward silvery, shut in the Day, and open at Night.

5. MESEMBRYANTHEMUM foliis semiteretibus salcatis, caule arborescente. *Mesembryanthemum* with taper salcated Leaves, and a Tree-like Stalk. This is the *Ficoides Africana arborescens, folio tereti, flore candido*

notu

noctu aperto interdiu clauso. Boerb. Ind. alt. 1. 291. African Tree Fig Marygold, with a taper Leaf, and a white Flower opening at Night, but shut in the Day.

6. MESEMBRYANTHEMUM foliis subtrigonis, subulatis, caule erecto, corymbo trichotoma. Lin. Sp. Plant. 481. Mesembryanthemum with Awl-shaped, three cornered Leaves, an erect Stalk, and a Corymbus of Flowers at the triple Division of the Stalk. This is the *Ficoides Africana erecta teretifolia, floribus albis umbellatis*. Par. Bat. 166. Upright African Fig Marygold, with a taper Leaf, and white Flowers growing in Umbels.

7. MESEMBRYANTHEMUM acaule, foliis subteretibus connatis, floribus octagynis. Lin. Sp. Plant. 481. Mesembryanthemum without Stalk, half taper Leaves which join at their Base, and Flowers having eight Styles. This is the *Ficoides Capensis humilis, cepae folio, flore stamineo*. Brad. succ. Low Fig Marygold of the Cape, with an Onion Leaf, and a stameneous Flower.

8. MESEMBRYANTHEMUM foliis lanceolatis planis crenulatis. Hort. Cliff. 217. Mesembryanthemum with plain Spear shaped Leaves, which are somewhat crenated. This is the *Ficoides Africana, procumbens tripolii folio, flore argenteo*. Hort. Chelf. Trailing African Fig Marygold, with a Tripolium Leaf and a silvery Flower.

9. MESEMBRYANTHEMUM acaule, foliis triquetris linearibus ap. cetrifariam dentatis. Hort. Cliff. 218. Mesembryanthemum without Stalk, having narrow three cornered Leaves, marked with three Indentures at their Points. *Ficoides Capensis humilis, folio triangulari in summitatem dentato, flore minore purpurascens*. Brad. Succ. Dwarf Fig Marygold of the Cape, with a triangular Leaf indented at the Top, and a smaller purplish Flower.

10. MESEMBRYANTHEMUM acaule, foliis subulatis triquetris dorso supernè ferratis. Mesembryanthemum without a Stalk, and Awl-shaped three cornered Leaves, whose Back Part is sawed toward the Top.

11. MESEMBRYANTHEMUM caulescens, foliis deltoidibus triquetris dentatis. Hort. Cliff. 218. Mesembryanthemum having Stalks, and three cornered indented Leaves, which are shaped like the Greek Delta. This is the *Ficoides Africana, folio triangulari crasso, brevi, glauco, ad tres margines aculeato*. Boerb. Ind. alt. 1. 290. African Fig Marygold, with a short thick, gray, triangular Leaf, with Prickles on the three Edges.

12. MESEMBRYANTHEMUM caulescens, foliis deltoidibus, lateribus minimè dentatis. Stalky Mesembryanthemum, with Leaves shaped like the Greek Delta, whose Sides are a little indented. This is the *Ficoides Africana, folio triangulari glauco, brevissimo, crassissimo, margine non spinoso*. Boerb. Ind. alt. 1. 290. African Fig Marygold, with very thick short triangular gray Leaves, having no Spines on their Edges.

13. MESEMBRYANTHEMUM acaule, foliis apice barbatis. Mesembryanthemum without Stalks, and the Points of the Leaves bearded. This is the *Ficoides seu ficus aizoides Africana, folio variegato aspero, ad apicem stella spinosa armato*. Boerb. Ind. alt. 1. p. 291. African Fig Marygold with a rough variegated Leaf, whose Point is armed with Spines in Form of a Star.

14. MESEMBRYANTHEMUM caulibus subfruticosis decumbentibus, foliis teretibus apice barbatis. Mesembryanthemum with decumbent Stalks which are shrubby, and taper Leaves with bearded Points. *Ficoides Capensis frutes-*

cens, folio tumido, extremitate collata, flore purpureo. Brad. Succ. Shrubby Fig Marygold of the Cape, with a Star-pointed tumid Leaf, and a purple Flower.

15. MESEMBRYANTHEMUM caule hispido, foliis cylindricis deflexis. Lin. Sp. Plant. 482. Mesembryanthemum with a prickly Stalk, and deflexed cylindrical Leaves. This is the *Ficoides Africana, fruticosa, caule lanugine argenteo ornato, folio tereti, parvo, longo, guttulis argenteis quasi scabro, flore violaceo*. Boerb. Ind. alt. 1. 291. African shrubby Fig Marygold, having Stalks adorned with silvery Down, and long small taper Leaves spotted as it were with silvery Drops, and a Violet coloured Flower.

16. MESEMBRYANTHEMUM caule foliisque pubescentibus. Hort. Cliff. 217. Mesembryanthemum whose Stalks and Leaves are garnished with downy Hairs.

17. MESEMBRYANTHEMUM foliis subulatis subtus undique scabris. Hort. Cliff. 219. Mesembryanthemum with Awl-shaped Leaves, which are every where rough on their under Side. This is the *Ficoides Africana, folio triangulari viridi longo aspero, flore violaceo*. Boerb. Ind. alt. 290. African Fig Marygold, with a long, green, rough, triangular Leaf, and a Violet coloured Flower.

18. MESEMBRYANTHEMUM articulis caulinis terminatis in folia acuminata subtus dentata. Hort. Cliff. 218. Mesembryanthemum whose Joints of the Stalks are terminated by acute pointed Leaves, which are indented on their under Side. This is the *Ficoides Africana, folio triangulari glauco, perfoliato, brevissimo, apice spinoso*. Boerb. Ind. alt. 290. African Fig Marygold, with a short perfoliated triangular Leaf whose Point is prickly, commonly called Buckthorn *Ficoides*.

19. MESEMBRYANTHEMUM perfoliatum, foliis majoribus, apicibus triachanthis. Hort. Eltb. 251. Perfoliate Mesembryanthemum with larger Leaves, whose Points have three Thorns. This is the *Ficoides Africana frutescens perfoliata, folio triangulari glauco punctato, cortice lignoso candido tenui*. Tourn. Aët. Par. 1705. Shrubby perfoliate African Fig Marygold, with a triangular, gray, spotted Leaf, and a thin, white, ligneous Bark, commonly called Stagthorn *Ficoides*.

20. MESEMBRYANTHEMUM spinis ramosis. Hort. Cliff. 216. Mesembryanthemum with branching Spines. This is the *Ficoides Africana, aculeis longissimis & foliis nascentibus ex foliorum alis*. Tourn. Aët. R. Par. 1705. African Fig Marygold with long Spines, and smaller Leaves arising from the Wings of the Leaves.

21. MESEMBRYANTHEMUM foliis subulatis papillofis, radice capitata. Hort. Cliff. 216. Mesembryanthemum with Awl-shaped pimply Leaves, and a headed Root. This is the *Ficoides Africana, folio triangulari recurvo, floribus umbellatis obsoleti coloris, externè purpureis*. Tourn. Aët. Par. 1705. African Fig Marygold with a triangular recurved Leaf, and umbellated Flowers of a dark Colour, which are purple on their Outside.

22. MESEMBRYANTHEMUM foliis subulatis semiteretibus glabris, internodio longioribus. Hort. Cliff. 216. Mesembryanthemum with Awl-shaped half taper smooth Leaves, which are longer between the Joints. This is the *Ficoides Capensis humilis, teretifolia, flore coccineo*. Brad. Succ. p. 13. Low Fig Marygold of the Cape, with a taper Leaf, and scarlet Flower.

23. MESEMBRYANTHEMUM foliis subulatis subcylindraceis obsoletè papillofis distinctis. Hort. Cliff. 220. Mesembryanthemum with subcylindrical Leaves, which are

sem-

semibryanthemum with Awl-shaped cylindrical Leaves, having distinct dark coloured Pimples. *Ficoides Africana erecta arborescens, geniculato caule, foliis viridi.* Boerb. Ind. alt. 1. 291. Upright Tree like African Fig Marygold with a jointed Stalk, and a green Leaf.

24. MESEMBRYANTHEMUM *caule repente semicylindraceo, foliis semicylindricis laevibus connatis, apice triquetris.* Hort. Cliff. 217. *Mesembryanthemum* with a creeping Stalk, which is half cylindrical, and half cylindrical smooth Leaves, joining at their Base, whose Points are three cornered. This is the *Ficoides Africana reptans, folio triangulari, flore saturate purpureo.* Brad. Succ. p. 16. Tab. 38. Creeping African Fig Marygold with a green triangular Leaf, and deep purple coloured Flower.

25. MESEMBRYANTHEMUM *foliis acinaciformibus distinctis laevibus, ramis teretibus.* Hort. Cliff. 219. *Mesembryanthemum* with distinct smooth Falchion-shaped Leaves; and taper Branches. This is the *Ficoides Afra folio triangulari ensiformi brevissimo, flore dilate purpurascente filamentoso.* Brad. Succ. Dec. 5. Tab. 42. African Fig Marygold with a triangular Cimeter-shaped short Leaf, and a pale purplish Flower.

26. MESEMBRYANTHEMUM *foliis acinaciformibus connatis laevibus, caule decumbente.* *Mesembryanthemum* with smooth Falchion-shaped Leaves, which are connected at their Base, and a trailing Stalk. This is the *Ficoides seu ficus aizoides Africana major procumbens, folio triangulari ensiformi.* H. L. 247. Greater trailing African Fig Marygold with a triangular Cimeter shaped Leaf.

27. MESEMBRYANTHEMUM *falcatum majus, flore amplo luteo.* Hort. Elth. 283. Greater *Mesembryanthemum* with Sithe-shaped Leaves, and a large yellow Flower. This is the *Ficoides seu ficus aizoides Africana major procumbens, triangulari folio, fructu maximo eduli.* H. L. 244. Greater trailing African Fig Marygold with a triangular Leaf, and a large eatable Fruit.

28. MESEMBRYANTHEMUM *foliis subtriquetris scabris, corollis bicoloribus.* Lin. Sp. P. 485. *Mesembryanthemum* with rough three-cornered Leaves, and Petals to the Flower, which are of two Colours. *Ficoides Capensis frutescens, folio tereti punctato, petalis luteis.* Brad. Succ. 1. p. 8 Tab. 7. Shrubby Fig Marygold of the Cape, with a taper Leaf, having Punctures, and yellow Petals.

29. MESEMBRYANTHEMUM *foliis subulatis triquetris, angulo carinali-retrorsum serratis.* Hort. Cliff. 218. *Mesembryanthemum* with Awl-shaped, three-cornered Leaves, whose Keel-shaped Angle is sawed on the Outside. *Ficoides Africana folio longo triangulari incurvo, caule purpureo.* Tourn. African Fig Marygold with a long triangular Leaf, which is incurved, and a purple Stalk.

30. MESEMBRYANTHEMUM *foliis subulatis subcylindraceis papillofis distinctis, caule scabro.* Hort. Cliff. 220. *Mesembryanthemum* with Awl-shaped cylindrical Leaves, which are pimply and distinct, and a rough Stalk. This is the *Ficoides Capensis, folio tereti argenteo, petalis perplurimis aurantiacis.* Brad. Succ. 1. p. 9. Tab. 8. Fig Marygold of the Cape with a silvery taper Leaf, and Flowers having many Orange coloured Petals.

31. MESEMBRYANTHEMUM *foliis linearibus obsolete triquetris distinctis, summis imbricatis, laevibus.* Hort. Cliff. 220. *Mesembryanthemum* with linear, obsolete three-cornered Leaves, distinct and smooth, and imbricated at the Top. *Ficoides capensis frutescens, foliis teretibus confertis*

glaucis, flore albo. Brad. Succ. 1. p. 7. Tab. 6. Shrubby Fig Marygold of the Cape, with taper gray Leaves growing in Clusters, and a white Flower.

32. MESEMBRYANTHEMUM *acaule, foliis semicylindricis connatis externè tuberculatis.* Hort. Cliff. 219. *Mesembryanthemum* without Stalk, and half cylindrical Leaves, which have Tubercles on their Outfides, and are joined together. *Ficoides Afra, folio triangulari, longo, succulento, caulibus rubris.* Boerb. Ind. African Fig Marygold with a long triangular succulent Leaf, and red Stalks.

33. MESEMBRYANTHEMUM *foliis subcylindricis acutis connatis arcuatis laevibus.* Hort. Cliff. 220. *Mesembryanthemum* with acute cylindrical Leaves, which are connected at their Base, bowed and smooth. This is the *Ficoides Afra arborescens, folio tereti glauco, apice purpureo crasso.* Boerb. Ind. alt. 291. African Tree Fig Marygold with a taper gray Leaf, having a thick purple Top.

34. MESEMBRYANTHEMUM *foliis subulatis triquetris striatis acutis, punctis pellucidis obsolete sparsis.* Hort. Cliff. 220. *Mesembryanthemum* with Awl-shaped three cornered Leaves, marked with obsolete pellucid Punctures. *Ficoides Afra caule lignoso, erecta, folio triangulari ensiformi scabro, flore luteo magno.* Boerb. Ind. African Fig Marygold with an erect ligneous Stalk, a triangular Cimeter-shaped rough Leaf, and a large yellow Flower.

35. MESEMBRYANTHEMUM *caulescens, foliis subulatis semicylindricis recurvis connatis longis.* Hort. Cliff. 219. Stalky *Mesembryanthemum* with Awl-shaped semicylindrical recurved long Leaves, which are connected at their Base. *Ficoides Afra folio triangulari longissimo, marginibus obtusioribus, flore amplo, intus pallide luteo, extus lineâ rubrâ longâ picto.* Boerb. Ind. alt. 289. African Fig Marygold with a long triangular Leaf, obtuse Borders, and a large Flower of a pale yellow within, and marked with a long red Streak on the Outside.

36. MESEMBRYANTHEMUM *caulibus procumbentibus, foliis subtriquetris angulis obtusioribus recurvis connatis, pedunculis brevioribus.* *Mesembryanthemum* with trailing Stalks, three-cornered Leaves, whose Angles are obtuse, recurved and connected at their Base, and shorter Foot Stalks to the Flower. *Ficoides Africana humifusa, folio triangulari longiore glauco, flore flavescente.* Tourn. Acad. Trailing African Fig Marygold with a longer gray triangular Leaf, and a yellowish Flower.

37. MESEMBRYANTHEMUM *foliis planis oppositis ovatis acuminatis connatis integerrimis.* *Mesembryanthemum* with plain Leaves placed opposite, which are oval, entire, acute pointed, and connected at their Base. This is the *Ficoides Africana procumbens, foliis planis conjugatis, lucidis persoliata, floribus amplis filamentosis ex albo flavescens.* Brad. Dec. 34 p. 7. Tab. 25. Trailing African Fig Marygold with plain Leaves set by Pairs, which are lucid, and surround the Stalk with their Base, and bear a large whitish yellow Flower.

38. MESEMBRYANTHEMUM *foliis planis congestis externè punctatis acuminatis integerrimis.* *Mesembryanthemum* with plain Leaves growing in Clusters, which are entire, acute-pointed, and spotted on their Outside. This is the *Ficoides Capensis procumbens olea folio, flore albo medio croceo.* Brad. Succ. Dec. 2. p. 7. Tab. 16. Trailing Fig Marygold of the Cape, with an Olive Leaf, and a white Flower of a Saffron Colour in the Middle.

39. MESEMBRYANTHEMUM *subacaule, foliis ciliatodentatis.*

dentatis. Lin. Hort. Cliff. 218. *Mesembryanthemum* with a short Stalk, and Leaves having hairy Indentures. This is the *Ficoides Capensis humilis*, *foliis triangulari prope summitatem dentato, flore luteo*. Brad. Succ. Dec. 2. p. 8. Tab. 17. Low Fig Marygold of the Cape, with a triangular Leaf indented toward the Top, and a yellow Flower, commonly called Dogs Chap *Ficoides*.

40. *MESEMBRYANTHEMUM acaule, foliis crassis triquetris, margines laterales ciliato dentatis, pedunculis brevibus*. *Mesembryanthemum* without Stalk, having thick three-cornered Leaves, whose Sides are beset with hairy Indentures, and very short Foot Stalks to the Flower. This is the *Ficoides Afra foliis triangulari, ensiformi crasso brevi, ad margines laterales multis majoribus spinis aculeato*. Martyn. Cent. 30. Tab. 30. African Fig Marygold with a triangular, Cimeter-shaped, short, thick Leaf, whose Side Borders have many large Spines, commonly called Cats Chap *Ficoides*.

41. *MESEMBRYANTHEMUM foliis dolabriformibus*. Hort. Cliff. 219. *Mesembryanthemum* with Ax-shaped Leaves. *Ficoides Capensis humilis, foliis cornua cervi referentibus, petalis luteis, nodiflora*. Brad. Succ. Low Fig Marygold of the Cape, with Leaves like a Stag's Horn, yellow Petals, and a Flower opening at Night.

42. *MESEMBRYANTHEMUM foliis difformibus*. Prod. Leyd. 287. *Mesembryanthemum* with deformed Leaves. This is the *Ficoides Afra foliis latissimis crassissimis lucidis, difformibus*. Boerb. Ind. alt. 292. African Fig Marygold with very broad, thick, shining, deformed Leaves.

43. *MESEMBRYANTHEMUM acaule, foliis linguiformibus altero margine crassioribus*. Hort. Cliff. 219. *Mesembryanthemum* without Stalk, and Tongue-shaped Leaves, whose Borders are thicker on one Side. *Ficoides Afra acaulos, foliis latissimis crassis lucidis conjugatis, flore aureo amplissimo*. Tourn. Acad. African Fig Marygold without Stalk, broad thick shining Leaves growing by Pairs, and a very large yellow Flower.

44. *MESEMBRYANTHEMUM acaule, foliis linguiformibus latissimis, pedunculis brevioribus*. *Mesembryanthemum* without Stalk, very broad Tongue-shaped Leaves, and shorter Foot Stalks to the Flowers. This is the *Ficoides Afra acaulos, foliis latissimis crassissimis, lucidis conjugatis, flore aureo amplo, pedunculo brevi*. Boerb. Ind. alt. 292. African Fig Marygold having no Stalk, very broad, thick, shining Leaves placed by Pairs, and a large golden Flower with a short Foot Stalk.

45. *MESEMBRYANTHEMUM subacaule foliis subtriquetris glaucis integerrimis obtusioribus*. *Mesembryanthemum* having no Stalk, and gray entire three-cornered Leaves, which are very obtuse. *Mesembryanthemum foliis robustis albicantibus*. Hort. Elth. 243. *Mesembryanthemum* with strong whitish Leaves, and the *Ficoides Afra foliis triangulari crasso, succulentissimo*. Boerb. Ind. African Fig Marygold with a thick triangular succulent Leaf.

46. *MESEMBRYANTHEMUM foliis alternis subulatis triquetris longissimis*. Hort. Cliff. 216. *Mesembryanthemum* with alternate Awl-shaped three-cornered Leaves, which are very long. This is the *Ficoides Capensis, caryophylli folio, flore aureo specioso*. Brad. Succ. Dec. 2. p. 5. Tab. 14. Fig Marygold of the Cape, with a Clove Gilliflower Leaf, and a beautiful golden coloured Flower.

47. *MESEMBRYANTHEMUM foliis subulatis triquetris incurvis, ramis dependentibus*. *Mesembryanthemum* with

Awl-shaped, incurved, three-cornered Leaves, and declining Branches. This is the *Ficoides Afra foliis triangulari longo glauco, marginibus obtusis*. Boerb. Ind. alt. 290. African Fig Marygold with a long triangular Leaf of a gray Colour, whose Edges are obtuse.

These Plants are most of them Natives of the Cape of Good Hope, from whence their Seeds were first brought to Holland, and the Plants raised in many of their curious Gardens, and have since been communicated to most Parts of Europe; these were at first titled *Cbrysanthemum*, by the old Botanists, but afterward they were titled *Ficoides* by Herman and Tournefort, from their Capsules being shaped like little Figs, afterward they had this Title of *Mesembryanthemum* applied to them, which signifies a Flower opening in the Middle of the Day, as most of the Species do; there are three or four of them which open in the Evening, and are closed all the Day; these have been separated from the others by some, and have had the Title of *Nycteranthemum*, from their Flowers being expanded in the Night; but as they all agree in the Characters which distinguish the Genus, they should by no means be separated.

Most of the Plants of this Genus have beautiful Flowers, which appear at different Seasons of the Year, some of them flower early in the Spring, others in Summer, some in Autumn, and others in Winter; many of them produce their Flowers in such Quantity, that when expanded, the Plants are entirely covered with them; they have all thick succulent Leaves, but some of the Species are much more so than others, and the Figures of their Leaves vary so much in the several Species, that they afford an agreeable Variety when they are not in flower.

To describe all the Species here mentioned, would swell this Work too much, and as their Titles are short Descriptions of the Species, I shall not enlarge more on that Head, but proceed to their Culture.

All the Sorts here mentioned are perennial Plants, except the two first, which are annual. The perennial Sorts are easily propagated by Cuttings during any of the Summer Months; such of them as have shrubby Stalks and Branches, do very readily take Root when planted in a Bed of light Soil, and covered either with Mats, or Glasses, but when they are covered with the latter, they must be shaded every Day when the Sun is warm; these Cuttings of the shrubby Sorts need not be cut from the Plants more than four or five Days before they are planted, during which Time they should be laid in a dry Room, not too much exposed to the Sun, that the Part which was separated from the old Plants, may heal over and dry before they are planted, otherwise they are apt to rot; these may be planted at about three Inches Distance from each other, and the Earth pressed close to them, but none of their Leaves should be buried in the Ground, for as they abound with Moisture, so if they are covered with the Earth, it will cause them to rot, and that often destroys the Cuttings; therefore when the Cuttings are taken from the old Plants, they should be divested of their lower Leaves, so far as may be necessary, to allow a naked Stalk of sufficient Length for planting.

When the Cuttings are planted, it will be necessary to give them a little Water to settle the Ground about them, but it should be done with Caution, for too much Wet will spoil them; if these are shaded every Day from

nine or ten o'Clock, till three or four, when the Sun is warm, it will prevent the Ground from drying too fast, so that the Cuttings need not be watered oftener than once a Week; but if there should happen some gentle Showers of Rain, it will be proper to take off their Covers, and let them receive it, but they should be screened from hard Rains. The Cuttings thus managed will have put out good Roots in about six Weeks, when they should be carefully taken up, and each planted in a separate small Pot filled with light sandy Earth, and then placed in a shady Situation, giving them a little Water to settle the Earth to their Roots; in this Place they may remain about ten Days, or a Fortnight, by which Time they will have taken good Root, and may be removed to a sheltered Place, where they may have more Sun, in which they may remain till Autumn; during the Summer Months, these may be watered twice, or, in very hot Weather, three Times a Week, but it must not be given them in too great Plenty; as the Sun declines in Autumn, once a Week will be sufficient, for if they are often supplied with it, the Plants will grow luxuriant; their Leaves and Branches will be so replete with Moisture, that the early Frosts in the Autumn will destroy them; whereas when they are kept dry, their Growth will be stunted, so that they will be hardy enough to resist small Frosts, but there must be Care taken that they do not shoot their Roots through the Holes of the Pots into the Ground, for when they do, the Plants will grow very luxuriant, and when the Pots are removed, and those Roots torn off, their Leaves and Branches will shrink, and not recover it in a long Time, if ever, to prevent which, the Pots should be removed every Fortnight, and where the Roots are beginning to come through the Pots, they should be cut off. The Sorts which grow very freely, should be shifted three or four Times in the Summer, to pare off their Roots, and keep them within Compass, and these should never be planted in rich Earth for the Reasons before given; for if the Earth is fresh, there will require no Dung, or other Compost, unless it is strong, in which Case Sea Sand, or Lime Rubbish, will be a good Mixture, the Quantity of either must be in Proportion to the Stiffness of the Ground, always being careful to render it so light, as that the Wet may easily pass off.

We next proceed to treat of those Sorts, whose Stalks and Leaves are very succulent. The Cuttings of these should be taken from the Plants ten Days or a Fortnight before they are planted, that they may have Time for their wounded Part to heal over and dry; the lower Leaves of these should also be stripped off, that their naked Stalks may be of a sufficient Length for planting. As these are mostly Plants of humble Growth, so if their Stalks are divested of their Leaves an Inch and a Half, it will be sufficient. The Cuttings of these Sorts require to be covered with Glasses, to keep off the Wet; they must also have less Water than the other, but in other Particulars will require the same Treatment. The Roots of these do not spread and extend so much as those of the other, so will not require to be shifted oftener than twice a Year at most; they must also be kept in small Pots, to confine their Roots; the Earth in which they are planted, should be rather light

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and not rich. During the Summer Season, they must not have too much Wet, and in the Winter they must have but little Water. If these succulent Sorts are placed in an open airy Glass Case in Winter, where they may have free Air admitted to them in Plenty in mild Weather, and screened from the Frost, they will thrive much better than when they are more tenderly treated.

The other shrubby Kinds may be sheltered in Winter under a common Frame, where, if they are protected from Frost and Wet, it is all they require; for the hardier these are treated, the greater Quantity of Flowers they will produce: And some of the Sorts are so hardy, as to live abroad when planted close to a good aspected Wall, and in a poor dry Soil, so that where there is Room to dispose them against a Wall, and the Border is raised with Lime Rubbish to prevent their rooting deep and growing luxuriant, they may be preserved through the Winter with very little Shelter, and these will flower much better than those under Cover.

The first Sort grows naturally in *Egypt*, where they cut up the Plants, and burn them for Pot-ash; and this is esteemed as the best Sort for making hard Soap, and the best Sort of Glass.

This is an annual Plant, which does not perfect Seeds in *England*; for when it is placed in the Stove, or kept in the hot Bed, their Stalks grow long and slender, so are not productive of Flowers; and those which are raised in hot Beds, and afterward exposed in the open Air, will flower pretty freely, but do not perfect their Seeds. As this Plant will thrive in *South Carolina* as well as its native Soil, it might turn to the Advantage of that Colony, and likewise become beneficial to the Publick, if the Inhabitants could be prevailed on to cultivate it.

The second Sort is annual; this is a Native at the *Cape of Good Hope*. It is propagated for the Oddness of its Leaves and Stalks, which are closely covered over with pellucid Pimples full of Moisture, which, when the Sun shines on the Plants, reflect the Light, and appear like small Bubbles of Ice, from whence some have called it the Ice Plant, and others have named it the Diamond Plant, or Diamond *Ficoides*.

This Sort is propagated by Seeds, which must be sown on a hot Bed early in the Spring; and when the Plants come up, they must be planted on a fresh hot Bed to bring them forward; after they have taken Root in the hot Bed, they should have but little Wet, for Moisture will rot them. When they are grown large enough to transplant again, they should be each planted into a small Pot filled with light fresh Earth, but not rich, and plunged into a hot Bed of Tan, observing to shade them in the Heat of the Day until they have taken new Root; then they should have Plenty of fresh Air admitted to them every Day in warm Weather, to prevent their drawing weak. In the latter End of *June*, some of the Plants may be inured to bear the open Air, and afterward they may be turned out of the Pots, and planted into a warm Border, where they will thrive and spread their Branches to a great Distance upon the Ground; but these Plants will not be very productive of Flowers, therefore some of them must be continued in the small Pots, and may at the same Time, when the others are planted out, be removed into the Stove or

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Glass Case, placing them upon the Shelves, that their Roots may not get out from the Bottom of the Pots, so that they may be confined, which will cause them to flower plentifully, and from these, good Seeds may every Year be obtained.

MESPILUS *Miomad.*, Gr.] Tourn. *Inst. R. H.* 641. Tab. 410. *Lin. Gen. Plant.* 549. The Medlar.

The Characters are,

The Empalement of the Flower is permanent, of one Leaf, cut into five spreading concave Segments. The Flower is composed of five roundish concave Petals, which are inserted in the Empalement. The Number of Stamina are different in the several Species, from 10 to 20 or more; these are also inserted in the Empalement, and are terminated by single Summits. The Germen is situated under the Flower, and supports an uncertain Number of Styles from three to five, which are crowned by beaded Stigmas. The Germen becomes a roundish or oval Berry, carrying the Empalement on its Top, and inclosing four or five hard Seeds.

The Species are,

1. MESPILUS *inermis*, foliis lanceolatis dentatis acuminatis, subtus tomentosis, calycibus acuminatis. Smooth Medlar, with Spear-shaped, acute-pointed, indented Leaves, woolly on their under Side, and acute-pointed Empalements. This is the *Mespilus folio laurino major*, fructu minori, rariori substantia. Hort. Catb. Greater Medlar with a Bay Tree Leaf, and a smaller Fruit.

2. MESPILUS *inermis*, foliis lanceolatis integerrimis subtus tomentosis, calycibus acuminatis. Hort. Cliff. 189. Unarmed Medlar with Spear-shaped entire Leaves, downy on their under Side, and acute-pointed Empalements. *Mespilus Germanica*, folio laurino, non serrato, sive *Mespilus sylvestris*. C. B. P. German Medlar with a Bay-Tree Leaf which is not sawed, or wild Medlar.

3. MESPILUS *inermis*, foliis quinquefidis, subtus leviter villosis acutis. Unarmed Medlar with five-pointed acute Leaves, a little hairy on their under Side. This is the *Mespilus apii folio laciniato*. C. B. P. Medlar with a cut Smallage Leaf, commonly called *L'Azarole*.

4. MESPILUS foliis obtusis bitrifidis serratis, ramis aculeatis. Medlar with obtuse bitrifid Leaves sawed, and prickly Branches. *Mespilus apii folio sylvestris*, spinosa, sive *oxyacantha*. C. B. P. Wild Medlar with a Smallage Leaf and prickly Branches, or common Hawthorn.

5. MESPILUS *inermis*, foliis trilobatis obtusis glabris serratis, pedunculis trifloris. Unarmed Medlar with obtuse smooth sawed Leaves which have three Lobes, and Foot Stalks bearing three Flowers. This is the *Mespilus apii folio laciniato*, fructu ex albo lutescente minori. Hort. Catb. Medlar with a cut Smallage Leaf, and a yellowish white smaller Fruit.

6. MESPILUS *spinosa*, foliis lanceolato-ovatis crenatis, calycibus fructibus obtusis. Hort. Cliff. 189. Prickly Medlar, with Spear-shaped, oval, crenated Leaves, and obtuse Empalements to the Fruit. This is the *Mespilus aculeata*, amygdali folio. Tourn. *Inst.* 642. Prickly Medlar with an Almond Leaf, called *Pyracantha*.

7. MESPILUS *spinosa* foliis ovatis acutis repando-angularis serratis venosis. Prickly Medlar, with oval, acute, angular, sawed Leaves, which are veined and bent back. This is the *Mespilus spinosa* sive *oxyacantha Virginiana*

maxima. Cat. Hort. Angl. 49. Largest prickly Medlar of Virginia, called Cockspur Hawthorn.

8. MESPILUS *inermis* foliis ovatis repando-angularis serratis glabris. Medlar without Thorns, and oval, sawed, smooth Leaves bent back, and have Angles, commonly called Cockspur Hawthorn without Thorns.

9. MESPILUS foliis lanceolato-ovatis crenatis glabris, ramis spinosis. Medlar with Spear-shaped, oval, crenated, smooth Leaves and prickly Branches. This is the *Mespilus aculeata*, pyrifolia denticulata splendens, fructu insigni rutilo, Virginienfis. Pluk. Alm. Virginia prickly Medlar, with a shining, indented Pear Tree Leaf, and a large red Fruit, called Virginia *L'Azarole*.

10. MESPILUS foliis lanceolatis serratis, spinis robustioribus, floribus corymbosis. Fig. Pl. Tab. 178. fol. 2. Medlar with Spear-shaped sawed Leaves, very strong Spines, and Flowers growing in round Bunches. *Mespilus pruni foliis* spinis longissimis fortibus, fructu rubro magno. Clayt. Flor. Virg. 55. Medlar with a Plum Tree Leaf, very long strong Thorns, and a large red Fruit.

11. MESPILUS foliis cordato-ovatis acuminatis, acutis serratis, ramis spinosis. Fig. Plant. Tab. 179. Medlar with Heart-shaped, oval, acute-pointed Leaves, which are sharply sawed, and prickly Branches.

12. MESPILUS foliis oblongo-ovatis acuminatis angularis serratis glabris, ramis spinosis. Medlar with oblong, oval, acute-pointed smooth Leaves, angularly sawed, and prickly Branches. *Mespilus Virginiana*, apii folio, vulgari similis, major, grandioribus spinis. Pluk. Phyt. Virginia Hawthorn with a Smallage Leaf like the common Hawthorn, but larger, and having larger Thorns, called Maple-leaved Hawthorn.

13. MESPILUS foliis ovatis angularis serratis glabris, ramis inermibus. Medlar with oval smooth Leaves which are angularly sawed, and smooth Branches.

14. MESPILUS *inermis*, foliis ovato-lanceolatis nervosis serratis subtus villosis. Medlar without Thorns, and having oval, Spear-shaped, veined, sawed Leaves, hairy on their under Side.

15. MESPILUS foliis ovatis obtusis, supernè serratis, glabris, fructu ovato. Medlar with oval, obtuse, smooth Leaves, sawed toward their Points, and an oval Fruit, commonly called Pear-shaped Haw.

16. MESPILUS *inermis*, foliis obversè ovatis, supernè denticulatis utrinque viridibus. Medlar without Spines, and having obverse oval Leaves, slightly indented toward their Ends, and green on both Sides.

17. MESPILUS foliis lanceolato-ovatis serratis subtus villosis, floribus solitariis, calycibus foliaceis, spinis longissimis tenuioribus. Medlar with Spear-shaped oval Leaves sawed, and hairy on their under Side; Flowers growing singly with leafy Empalements, and very long Spines. *Oxyacantha folio parvo subrotundo*, flore unico, thecà foliaceà incluso summitatibus ramulorum insidente. Banist. Hawthorn with a small roundish Leaf, having one Flower shut up within a leafy Cover, placed at the Top of the Branches, commonly called Lord Islay's Haw.

18. MESPILUS *inermis*, foliis ovalibus serratis, cauliculis hirsutis. Lin. Sp. Plant. 478. Medlar without Thorns, having oval sawed Leaves, and hairy Stalks. This is the *Mespilus folio rotundiori*, fructu nigro subdulci. Tourn. *Inst.* 642. Medlar with a rounder Leaf and a black sweetish Fruit, commonly called *Amelanchier*.

19. *MESPILUS foliis ovato-oblongis glabris serratis, caule inermi*. Lin. Sp. Plant. 478. Medlar with oval, oblong, smooth, sawed Leaves, and Branches without Thorns.

20. *MESPILUS foliis ovatis integerrimis*. Hort. Cliff. 189. Medlar with oval entire Leaves. This is the *Mespilus folio subrotundo, fructu rubro*. Tourn. Inst. R. H. 642. Medlar with a roundish Leaf and a red Fruit, commonly called Dwarf Quince.

21. *MESPILUS inermis, foliis ovalibus serratis glabris, floribus capitatis, bracteis deciduis linearibus*. Lin. Sp. Plant. 479. Medlar without Thorns, having smooth, oval, sawed Leaves, headed Flowers, and linear Bractees which fall off. *Cotoneaster folio oblongo serrato*. C. B. P. 452. Bastard Quince with an oblong sawed Leaf.

22. *MESPILUS foliis ovatis crassis integerrimis, subtus tomentosis, floribus umbellatis axillaribus*. Medlar with oval, thick, entire Leaves, woolly on their under Side, and Flowers growing in Umbels from the Wings of the Stalk. This is the *Chamaecerasus Idaea*. Alp. Exot. 5. Dwarf Cherry of Mount Ida.

The 1st Sort grows naturally in Sicily, where it becomes a large Tree. This rises with a straight Stem, and the Branches grow more upright than those of the Dutch Medlar; the Leaves are narrower and not sawed on their Edges; the Flowers are smaller, and the Fruit is shaped like a Pear.

The 2d is generally called the Dutch Medlar; this never rises with an upright Stalk, but sends out crooked deformed Branches at a small Height from the Ground; the Leaves are very large, entire, and downy on their under Side. The Flowers are very large, as are also the Fruit, which are rounder, and approach nearer to the Shape of an Apple. This being the largest Fruit, is now generally cultivated in Gardens; but there is one with smaller Fruit, called the Nottingham Medlar, of a much quicker and more poignant Taste than this; which is, I suppose, only a Variety, so I have not enumerated it as a distinct Species.

The 3d Sort grows naturally in Sicily, and the Islands of the Archipelago; of this there are several Varieties, which differ in the Form and Size of their Leaves, some being cut into five, others into six or seven Lobes; these are sometimes sawed on their Edges, and others are entire; some of them have oval large Fruit, and others smaller, rounder, and of different Colours; some almost white, others yellow, and some red. These Fruit are cultivated for the Table in most Parts of Italy, where they are eaten in Autumn and Winter, as the common Medlars in England.

The 4th Sort is the common Hawthorn, generally cultivated in England for Fences to inclose Fields, and is one of the best and most durable Plants for that Purpose, which we have in this Country. There are several Varieties of this, which differ in the Size of their Leaves, the Manner in which they are cut, and the Size and Shape of their Fruit; but those with the smallest Leaves, are the best for close Hedges, because their Branches grow closer together.

There is also a Variety of this with double Flowers, which is an ornamental Shrub for Gardens, for which Purpose it is propagated in the Nurseries. The *Glossenbury* Thorn is also a Variety of the common Hawthorn, from which it differs in flowering twice a Year; for in

mild Seasons it often flowers in November and December, and again at the usual Time with the common Sort; but the Stories which are told of its budding, blossoming, and fading, on Christmas Day, are ridiculous, having no Foundation.

These Varieties are propagated by budding or grafting them on the common Sort, for although they both produce some Fruit annually, yet the Plants which arise from those Seeds, will not prove the same.

The 5th Sort has much broader Leaves than the common Hawthorn, which are divided into three obtuse Lobes slightly sawed on their Edges, and are of a lucid green on their upper Surface and smooth. The Flowers are larger and each Foot Stalk sustains three of them; the Fruit is the Shape and Size of the common Haw, but of a yellowish white Colour; this came from Italy.

The 6th Sort is commonly known by the Title of *Pyracantha*, or ever-green Hawthorn. This does not rise to a Tree, for the Stalk and Branches are too slender and weak to stand without Support, so the Plants are generally planted against Walls or Buildings to cover them. It grows naturally in the Hedges in the South of France and Italy; the Branches are slender, covered with a dark brown Bark, and armed with a few long Thorns, upon which grow several small Leaves; the Leaves are about two Inches long and one broad in the Middle, of a lucid green, smooth, and slightly indented on their Edges. The Flowers come from the Side of the Branches in large Umbels, they are smaller than those of the common Hawthorn, and of a dirty white; these are succeeded by roundish umbilicated Berries, of a fiery red Colour, which ripen in Winter, and being intermixed with the ever green Leaves, make a fine Appearance at that Season.

This Sort may be propagated by Seeds, in the same Manner as the common Hawthorn, or by laying down the Branches, which, if young, and laid in Autumn, will put out Roots fit to remove in one Year; but when the old Wood is laid, it seldom puts out Roots in less than two or three Years, if they ever do.

The 7th Sort grows naturally in North America; this is called Cockspur Hawthorn, from the Shape of its Thorns, which are very strong, and bent downward like a Cockspur. This hath a strong Stem, which rises 8 or 10 Feet high, dividing into several Branches, garnished with oval Leaves which are three Inches long, and as much in Breadth, sawed on their Edges, and cut into acute Angles; they have several Veins running from the Mid-rib to the Edges, are of a light green on their upper Side, but pale on their under. The Flowers come out in large Umbels, from the Side, and at the Extremity of the Branches; they are white, and much larger than those of the common Hawthorn, having ten Stamina in each, which spread open in the same Manner as the Petals, terminated by small roundish Summits, and in the Center there are five Styles crowned by reflexed Stigmas. The Fruit are nearly as large as the common black Cherry, they are of a fine red Colour when ripe, and make a good Appearance in Autumn as do also their Flowers in Spring. This is a beautiful Tree in Parks, and the Fruit is good Food for the Deer, so it deserves to be propagated.

The 8th Sort is very like the seventh, but the

Branches have no Thorns on them; the Leaves are a little deeper sawed on their Edges, and not so deeply veined; this is a Native of the same Country, and grows to as large a Size as the seventh.

The 9th Sort is a Native of *North America*, where it grows to be a Tree of middling Size. The Stem is covered with a light Bark, the young Branches have a dark brown Bark; there are a few strong Thorns upon the Branches, but they are thinly placed. The Leaves are Spear shaped, about three Inches long and one broad, of a lucid green, and indented on their Edges. The Flowers are as large as those of the former Sorts, but the Umbels less; they have at least 20 Stamina, terminated by small red Summits, and but 3 Styles, crowned by indented Stigmas; the Empalement of the Flower is longer than the Petals; the Fruit is as large as that of the Cockspur Hawthorn, but a little oval-shaped, of a red Colour and ripens a little later.

The 10th Sort is also a Native of *America*; this is a Tree of humbler Growth than either of the three former; the Stem is covered with a rough Bark; the Branches have a dark brown smooth Bark, and are armed with longer and stronger Thorns than any of the other Species; they are between 2 and 3 Inches long and of a purplish Colour. The Branches shoot horizontally, and often bend downward, so are often interwoven one in another; these are garnished with Spear-shaped Leaves, about 3 Inches long, and one broad in the Middle; they are smooth, sawed on their Edges, and of a lucid green. From the Side of the Branches come out the Flowers, in roundish Bunches; they are white, with a little Blush of red, two standing upon one Foot Stalk; these have ten Stamina in each Flower, terminated by roundish red Summits; between these are situated 3 Styles, crowned by obtuse Stigmas; the Fruit is large, roundish, and a deep red when ripe. As this Sort is armed with strong Thorns, and the Branches naturally intermix, it will make one of the strongest Fences, if properly managed, that can be planted.

The 11th Sort was raised in the *Chelsea* Garden from Seeds, which came from *North America*. This hath a strong Stem about 5 Feet high, covered with a rough Bark, dividing into many spreading Branches, armed with long slender Thorns, and garnished with oval Leaves differing in Form, some being indented at their Foot Stalks, in Form of a Heart, and others are entire at that Part; some of them end in very acute Points, and others are obtuse; they are sharply sawed on their Edges, of a light yellowish green on their upper Side, and pale on their under Side, standing upon slender Foot Stalks. The Flowers come out in Bunches from the Side and at the End of the Branches; they are about the Size and Shape of those of the common Sort, having 8 Stamina in each, which spread open in the same Manner as the Petals; they have 4 Styles in each, crowned by obtuse Stigmas; the Fruit is of the same Size, Shape, and Colour, as the common Hawthorn.

The 12th Sort has been many Years in the *English* Gardens, but was brought from *Virginia*, where it grows naturally. This rises to a Tree of middling Size, the Branches are armed with a few slender Thorns, and are garnished with oblong, oval, angular Leaves about 3 Inches long, and two and a Half broad; they are smooth,

of a lucid green on their upper Side, but pale on their under; some of the Leaves are cut so deep on their Sides, as almost to divide them into Lobes, but others are more entire; they are slightly sawed on their Edges, standing on slender Foot Stalks, at the Base of which is situated a roundish Bractea, cut into five Segments upon the young Branches, but not on the older. The Flowers are produced in large Umbels at the End of the Branches; they are larger than those of the common Hawthorn; these have 20 Stamina, and 3 short Styles in each. The Fruit are rather smaller than those of the common Sort, and of a very bright red Colour, so make a fine Appearance in Autumn, as the Flowers do in Summer, for this Sort is one of the latest in blossoming. The Gardeners call it the Maple-leaved Haw.

The 13th Sort grows naturally in *North America*; this rises to a middling Height, with a pretty strong Stem, dividing into many spreading Branches which have no Thorns, but are garnished with oval Leaves sharply sawed on their Edges, and cut into many acute Angles; they are of a light yellowish green, and smooth. The Flowers come out at the End of the Branches in close Umbels, they are larger than those of the common Sort, and have 10 Stamina and 3 Styles in each. The Fruit is a little larger than that of the common Hawthorn, and of the same Colour.

The 14th Sort was raised from Seeds brought from *North America*; this rises with a strong upright Stem, sending out many strong Branches, covered with a dark brown Bark, and have no Thorns; these are garnished with oval Spear-shaped Leaves 4 Inches long, and two Inches and a Half broad sawed on their Edges, and have several strong Veins running from the Mid-rib to the Sides, in an upright Direction. The Leaves run along the short Foot Stalk to the Bottom, like Wings; they are of a dark green on their upper Side, but pale and hairy on their under. The Flowers come out in large Umbels at the Extremity of the Branches; they have a great Number of Stamina in each, terminated by round red Summits, and 3 Styles crowned by obtuse Stigmas. This Sort flowers late in the Summer, about the same Time with the eleventh.

The 15th Sort grows naturally in *North America*; this is a Tree of middling Growth. The Branches are covered with a dark brown Bark, and have no Thorns, but are garnished with oval obtuse Leaves, about two Inches and a Half long, and almost two Inches broad; some of these are broad at the Ends, others come more to a Point, their upper Parts are irregularly sawed, and most of them draw to a Point at the Foot Stalk; they are of a yellowish green on both Sides, and smooth. The Flowers are produced in small Bunches at the End of the Branches; their Empalements are cut into acute Segments. The Flowers are larger than those of the common Sort, and have ten Stamina in each, terminated by twin Summits, which are erect, and five Styles crowned by oblong erect Stigmas. The Fruit is pretty large, almost shaped like an Egg, and of an herbaceous yellow Colour when ripe; it is by the Gardeners called the Pear-shaped Haw.

The 16th Sort is a Native of *North America*; this is a Tree of humble Growth, seldom rising higher than the common Hawthorn. The Branches are without Spines, covered

covered with a grey Bark, and garnished with obverse oval Leaves, about two Inches and a Half long, and two Inches broad toward the Point, which is rounded and sawed, some of the Leaves being pointed, and others obtuse, lessening in their Width down to the Foot Stalk; they are of a bright green on both Sides. The Flowers are produced in large Umbels at the End of the Branches, and are about the Size of those of the common Sort; their Empalements are long, and cut into 5 very acute Segments. The Flowers have about 20 Stamina and 5 Styles. The Fruit is like the common Haw.

The 17th Sort was raised by his Grace the Duke of Argyle, in his curious Garden at *Whitton*, and has since been communicated to most of the curious Gardens in *England*, and is generally known by the Title of Lord *Islay's* Hawthorn; this is a Native of *North America*. The Seeds of it were sent from *Virginia*, by Mr. *Banister*, and some of the Plants were raised in the Bishop of *London's* Garden at *Fulham*, which were afterward destroyed with many other curious Shrubs and Trees; this is a Shrub of humble Growth, seldom rising more than 6 or 7 Feet, sending out a great Number of slender Branches, which are interwoven one in another; these are armed with very long slender sharp Thorns. The Leaves are scarce one Inch long, and some are not more than half an Inch broad, but others are almost as broad as they are long; they are sawed on their Edges, and have very short Foot Stalks. The Flowers are produced at the End of the Branches, generally one coming out from between the Leaves, but sometimes there are two or three, one below the other, at the Wings of the Stalks; they have large leafy Empalements, much longer than the Petals. The Flowers are small, sitting in the Empalement; they have 12 or more Stamina, and 4 Styles in each. The Fruit is smaller than the common Haw, crowned by the leafy Empalement, and is of an herbaceous yellow Colour, when ripe.

The 18th Sort grows naturally in *Austria, Italy*, and *France*, particularly near *Fontainebleau*; this rises with many slender Stalks, about 3 Feet high, which put out small Side Branches, covered with a dark purple Bark, and have no Thorns; these are closely garnished with oval Leaves, about three Quarters of an Inch long, and half an Inch broad, slightly sawed on their Edges; the small Side Branches which sustain the Flowers, are very hairy and woolly, as are also the Foot Stalks, and the under Side of the Leaves, but their upper Sides are smooth and green. The Flowers come out in Bunches at the End of the Shoots, which have 5 long narrow Petals, and about 10 Stamina in each. The Flowers are succeeded by small Fruit, which, when ripe, are black; the Gardeners call this *New England Quince*; there is one of this Kind which grows naturally in *North America*, but the Leaves are Wedge shaped, and not sawed on the Edges, so I take it to be a different Species.

The 19th Sort grows naturally in *Canada*; this is also a low Shrub, seldom rising more than 5 Feet high, dividing into several smooth Branches, covered with a purplish Bark. The Leaves grow upon long slender Foot Stalks; they are one Inch and a Half long, and an Inch broad, smooth on both Sides, and a little sawed on their Edges. The Flowers come out in small Bunches at the End of the Branches; they are about the Size of those

of the common Hawthorn, and are succeeded by small Fruit of a purplish Colour when ripe.

The 20th Sort grows naturally on the *Pyrenean Mountains*, and in other cold Parts of *Europe*; this rises with a smooth shrubby Stalk, about 4 Feet high, dividing into a few small Branches, covered with a purple Bark, and garnished with oval Leaves, little more than one Inch long, and about three Quarters broad; they are entire, and have very short Foot Stalks. The Flowers come out from the Side of the Stalks, 2 or 3 together; they are small, of a purplish Colour, and sit close to the Stalks; these appear in *May*, and are succeeded by small roundish Fruit, of a bright red when ripe.

The 21st Sort grows naturally in the northern Parts of *Europe*; this hath a smooth Stalk, rising about 4 or 5 Feet high, sending out slender Branches, covered with a purplish Bark, and garnished with oval smooth Leaves, about two Inches long, and one Inch and a Half broad, sawed on their Edges, but the Teeth point upward; they have pretty long slender Foot Stalks, and are of a yellowish green on both Sides. The Flowers come out from the Wings of the Stalk, 4 or 5 joined together in a close Head, of a purplish Colour; between the Flowers come out long narrow Bractea, which are purplish, and fall off as the Flowers begin to decay. The Fruit is small, and red when ripe.

The 22d Sort grows naturally on *Mount Ida*, in *Crete*, where the poor Shepherds feed upon the Fruit when ripe; this hath a smooth Stalk, covered with a brown Bark, and rises 8 or 10 Feet high, dividing into many smooth Branches, garnished with oval Leaves, two Inches and a Half long, and near two Inches broad; of a thick Substance, and a dark green on their upper, but downy on their under Side, standing upon short Foot Stalks. The Flowers come out from the Side of the Stalk, upon short small Branches, five or six growing on each in a close Bunch; they are of a purple Colour, the Petals being but little longer than the Empalement, which is woolly, and cut into 5 obtuse Segments. The Fruit is large, roundish, and a fine red when ripe.

All these Sorts are hardy enough to thrive in the open Air in *England*; several of them are very ornamental for Gardens, and all the larger growing Kinds are proper for Parks, where, during the Season of flowering, they make a fine Appearance; and, in Autumn, when the Fruit are ripe, they will afford an agreeable Variety, and will be Food for Deer and Birds, so that if Clumps of each Sort are planted in different Parts of the Park, nothing can be more ornamental.

All the *American* Kinds are usually propagated in the Nurseries, by grafting or budding them on the common white Thorn, but the Plants so propagated will never grow to half the Size of those which are raised from Seeds, so that where they are designed for Parks and large Plantations, those Plants should always be chosen which have not been grafted or budded, but are upon their own Roots, for several of the *American* Sorts naturally grow 20 Feet high, if they are not stunted by grafting; the grafted plants are only fit to intermix with Shrubs for Gardens, where they are not designed to grow large.

There are many who object to this Method of raising the Plants from Seeds, on Account of their Seeds not growing the first Year, as also from the tediousness of the

the Plants Growth after; but where a Person can furnish himself with the Fruit in Autumn, and take out their Seeds soon after they are ripe, putting them into the Ground immediately, the Plants will come up the following Spring; if they are kept clean from Weeds, and in very dry Weather supplied with Water, they will make good Progress, but if these are planted in the Places where they are to remain, after two Years Growth from Seeds, they will succeed much better, than when the Plants are of greater Age; if they are planted in Clumps in Parks, the Ground should be well trenched, and cleaned from the Roots of all bad Weeds; the Plants must also be securely fenced, otherwise the Cattle will soon destroy them. The best Time to transplant them is in Autumn, when their Leaves fall off; these should be constantly kept clean from Weeds, and if the Ground between the Plants be dug every Winter for the first seven Years, it will greatly encourage their Growth, and by that Time the Plants will have made such Progress, as to be strong enough to encounter and keep down the Weeds, so that if they are cut twice in the Summer, it will be sufficient, but the Inclosure must not be taken away, till their Stems are so large, and the Bark so rough, that the Cattle will not eat it off; their Stems should also be trained up so high, that the Branches may be out of the Reach of Cattle, otherwise they will crop them, especially those which have no Thorns.

If when these Clumps are planted, the Ground be inclosed with an Oak Pail, in the same Manner as that round Parks, the Fence will last as long as the Trees will require any Protection, but these Pales should not be quite close, for if they are placed so near each other at Bottom as to keep out Hares, it will be sufficient, and upward, if they are not so close, there will be more Air admitted to the Plants, which will be of Service to them, so that such Pales may be chosen for these Purposes, which are broader at one End than the other, and the broadest Ends turned downward. The Plants in these Clumps need not be placed at a greater Distance from each other than six Feet, for by being so near together, they will draw one another up taller, than where they have more Room to spread.

The *Glastenbury* Thorn, and that with double Flowers, can be no other Way propagated, than by grafting, or budding them upon the other Sorts, so where these Sorts are desired to grow large, they should be grafted or budded on Stocks of the Cockspur, or other large growing Kind, upon which these will grow to a much larger Size than upon the common white Thorn, or if they are budded upon the *Aria Theophrasti*, which grows to a large Size, they will also be much improved.

All the Sorts of *Mespilus* and *Crataegus* will take, by budding or grafting upon each other; they will also take upon the Quince, or Pear Stocks, and both these will take upon the Medlars, so that these have great Affinity with each other, and might be with more Propriety brought together under the same Genus, than the Pear and Apple, which will not take upon each other; but although the Pear will take upon the White Thorn, yet it is not advisable to make use of these Stocks, because they generally cause the Fruit to be small, and often to crack, and renders their Flesh stony, so unless it

is the very soft melting Kinds of Pears which are upon these Stocks, the Fruit will not be good.

The common Hawthorn is usually propagated for Fences; the best Plants for this Purpose, are those raised from Seeds, and the younger these are planted, the better they will succeed; where Hedges are raised from Seeds in the Places where they are to remain, the Plants will be stronger, and of longer Duration, than those which are transplanted; but there are few who have Patience to practise this Method. When the Seeds of this Sort are sown, the usual Way is to bury the Haws in the Ground one Year, and then take them up and sow them, because when the Haws are sown without being thus prepared, they do not grow the first Year, but where Persons are in Haste to raise the Plants, if they get the Haws as soon as they are ripe, and put them into a Tub, or Pot, and bury them in a Heap of hot Dung for a Month or six Weeks, in which Time they will ferment, and the Skin and Pulp will rot; then take them out, and macerate them in Water, to separate the Seeds, and sow them immediately after, the Plants will come up the first Year, as I have experienced, and hereby a Year will be saved. The after Management of these Plants, with the Method of transplanting them, and training them up, having been already fully treated of under the Article *Hedges*, I shall not repeat it here.

The five last mentioned Sorts, being Plants of humble Growth, are only proper for Gardens, so are generally intermixed with other flowering Shrubs to add to the Variety; these are frequently propagated in the Nurseries, by budding or grafting on the Stocks of the White Thorn; but as the Buds or Grafts of these Sorts do not keep Pace in their Growth with the Stocks, so after a few Years they will appear very unsightly, and many Times they are blown out of the Stocks, when their Heads are grown so large, as to stop the Wind in its Course, and thereby the Plants are destroyed; so that these Sorts should always be propagated by Seeds, or by laying down the young Branches, which will take Root in one Year, when they are carefully laid, and sometimes the Cuttings will take, if they are planted in Autumn, in a loamy Soil, and these Plants upon their own Roots will always thrive better, and continue longer, than those upon other Stocks. The Method of propagating these by Seeds being the same as for the other Species, it need not be repeated.

METHONICA. See *Gloriosa*.

MEUM. See *Athamanta*.

MEZEREON. See *Thymelæa*.

MICROPUS. *Lin. Gen. Plant.* 892. *Gnaphalodes Tourn. Inst. R. H.* 439. *Tab.* 261. Bastard Cudweed.

The Characters are,

It hath hermaphrodite and female Flowers, included in the same double Empalement; ten hermaphrodite Flowers compose the Disk; these have one Petal, are Funnel-shaped, erect, and cut into five Parts at the Top, and have five short bristly Stamina, terminated by cylindrical Summits, with an obsolete Germen supporting a short slender Style, crowned by an obsolete Stigma. In the same Empalement, are five female Flowers in the Circumference, which have each an oval compressed Germen hid under the Scales of the interior Empalement, each having a Style by their Side, which is bristly, turning toward the hermaphrodite Flowers.

ers, crowned by slender acute-pointed Stigmas, divided in two Parts. The female Flowers have each a single oval Seed succeeding them, included in the small Leaves of the Empalement; but the hermaphrodite Flowers are barren.

We have but one Species of this Genus, viz.

MICROPUS. Hort. Up. 275. Prod. Leyd. 145. *Gnaphalodes Lucitanica*. Tourn. Portugal Bastard Cudweed.

This is an annual Plant, which grows naturally in Portugal, near the Sea. The Root sends out several trailing Stalks, about 6 or 8 Inches long, garnished with small oval silvery Leaves, whose Base embrace the Stalks. The Flowers come out from the Wings of the Stalks in small Clusters; they are very small, white, and sit in a double Empalement, the interior being so large, as to almost hide the Flowers. It flowers in June and Ju'y, and the Seeds ripen Autumn; this is frequently preserved in Gardens, for the Beauty of its silvery Leaves; if the Seeds are sown in Autumn, or permitted to scatter, the Plants will rise in Spring, and require no Care but to keep them clean from Weeds, and thin them where too close. When the Seeds are sown in Spring, they seldom grow the first Year.

MICROSCOPE, a dioptrical Instrument, by means of which, very minute or small Objects are represented very large, and capable of being viewed very distinctly, according to the Laws of Refraction.

This Instrument may be of singular Use to a curious Enquirer into the Operation of vegetative Nature, by viewing nicely the several minute Vessels and Parts of Vegetables, in order to discover their various Uses, and how the Business of Vegetation is carried on, as also to examine the minute Parts of Flowers, which are not obvious to the naked Eye.

MILDEW is a Disease that happens to Plants, and is caused by a dewy Moisture which falls on them, and continuing, for want of the Sun's Heat, to draw it up, by its Acrimony corrodes, gnaws, and spoils the inmost Substance of the Plant, and hinders the Circulation of the nutritive Sap, upon which the Leaves begin to fade, and the Blossoms and Fruit are much prejudiced: Or,

Mildew is rather a concrete Substance, which exudes through the Pores of the Leaves.

What the Gardeners commonly call Mildew, is an Insect, which is frequently found in great Plenty, preying upon this Exudation.

Others say, That Mildew is a thick clammy Vapour, exhaled in the Spring and Summer from Plants, Blossoms, and even the Earth itself, in close still Weather, where there is neither Sun enough to draw it upwards to any considerable Height, nor Wind of Force strong enough to disperse it, and that, hanging in the lower Regions, when the Cold of the Evening comes on, it condenses, and falls on Plants, and with its thick clammy Substance stops the Pores, and by that Means prevents Perspiration, and hinders the Sap from ascending to nourish the Flowers, Shoots, &c.

Others say, That Mildew is a corrosive or nipping Dew, proceeding from Vapours exhaled by the Earth, which, being drawn up, and falling down again on the tender opening Buds, infects them by its Acrimony, and hinders the Circulation of the nutritious Sap in the proper Vessels, upon which the Leaves begin to fade, and the Blossoms and Fruit receive great Prejudice.

Some make this Observation; That the Places most liable to Mildew are inclosed Grounds and Valleys, and those that lie tending to the East, and the Reasons that they give why those Grounds which lie from the Horizon to the East, are most subject to Mildew and Blastings, may be by the Sun's attracting those Vapours towards it, after the Manner that a great Fire in a Room draws the Air to it; so the Sun having set these in Motion, and not having Strength enough to draw them into the middle Region, to form them into a Cloud, he does yet draw them till he be below the Horizon, and then these Dews tend to the Earth, from whence they were exhaled, and in Motion to the West, do, as it were, fall upon the Ground which lies Eastward, at right Angles, and therefore is most offensive to them.

But I take the true Cause of the Mildew appearing most upon Plants which are exposed to the East, to proceed from a dry Temperature in the Air when the Wind blows from that Point, which stops the Pores of Plants, and prevents their Perspiration, whereby the Juices of the Plants are concreted upon the Surface of their Leaves, which being of a sweetish Nature, Insects are inticed thereto, where, finding proper Nutriment, they deposit their Eggs, and multiply so fast as to cover the whole Surfaces of Plants, and, by corroding the Vessels, prevent the Motion of the Sap, and it is probable, that the Excrements of these Insects may enter the Vessels of Plants, and, by mixing with their Juices, may spread the Infection all over them; for it is observable, when a Tree has been greatly affected by Mildew, it seldom recovers it in two or three Years, and many Times never is entirely clear from it after.

Others suppose, That the Reason why Valleys afford more Moisture than Hills, is, because of the Dew which is attracted from the Earth and Herbs as before, and that they afford more Moisture than Hills (they say) is often seen by the Mists, which are more frequent on them than on Hills; this being drawn by the Sun in the Day Time, and wanting Wind to assist its Motion, hangs in the lower Region, and, when the Sun sets, it falls upon the Plants with its thick clammy Substance, and hinders the Sap of the Plant or Tree from ascending to nourish its Flowers, or Shoots, in those whose Bark is tender and young, and the Pores open with the Heat of the Season.

This Dew has been observed in the great leaved Cherries, such as the Black Heart, the White Heart, &c. to fall upon them at the Top, just at the Beginning of the Midsummer Shoot, which has so stopped the Shoot, that it has shot forth in other Places below, and that on the Top of these Shoots there have been many small Flies feeding on this Dew, and that it may plainly be seen and tasted on the Leaves of Oak and Maple.

Some are of Opinion, that Mildews and Blights are the same Thing; but others again, That Mildew is quite another Thing than Blastings. They say Mildews are caused from the Condensation of a fat and moist Exhalation in a hot and dry Summer, from the Blossoms and Vegetables of the Earth, and also from the Earth itself, which is condensed into a fat glutinous Matter by the Coolness and Serenity of the Air, and falls down on the Earth again, Part of which rests upon the Leaves of the Oak and other Trees, whose Leaves are smooth, and for that

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that Reason do not so easily admit the Moisture, as the Elm and other rougher Leaves do.

Other Parts of Mildew rest upon the Ears and Stalks of Wheat, bespotting the same with a different Colour from what is natural, being of a glutinous Substance, by the Heat of the Sun, and it binds up so close the tender Ears of Wheat, that it prevents the Growth, and occasions it to be very light in the Harvest.

Some are of Opinion, That Mildews are the principal Food of Bees, it being sweet, and easily converted into Honey.

MILIUM. Tourn. Inst. R. H. 514. Tab. 298. Lin. Gen. Plant. 73. [of Mille, Lat. a Thousand,] Millet.

The Characters are,

It is of the Corn, or Grass Tribe, with one Flower in each Chaff, the Chaff opening with two oval acute-pointed Valves. The Petal of the Flower is bivalve, and smaller than the Empalement. It hath three very short hairy Stamina, terminated by oblong Summits, and a roundish Germen with two hairy Styles, crowned by brush-shaped Stigmas. The Germen afterward turns to a roundish Seed, covered by the Petal of the Flower.

The Species are,

1. MILIUM paniculâ laxâ flaccidâ, foliorum vaginis pubescentibus. Millet with a loose hanging Panicle, and the Sheaths of the Leaves hairy. This is the *Milium semine luteo*. C. B. P. 26. Millet with a yellow Seed.

2. MILIUM paniculâ sparsâ erectâ, glumis aristatis. Millet with a loose erect Panicle, and bearded Chaff. This is the *Milium paniculâ amplâ erectâ sparsâ*. Houst. Mss. Millet with a large erect sparsed Panicle.

3. MILIUM foliis dispersis. Flor. Suec. 55. Millet with dispersed Leaves. This is the *Gramen sylvaticum paniculâ miliaceâ sparsâ*. C. B. P. 8. Wood Grass with a sparsed Millet-like Panicle.

4. MILIUM floribus confertis. Prod. Leyd. 57. Millet with Flowers growing in Clusters. This is the *Gramen paniculatum Alpinum, latifolium, paniculâ miliaceâ, sparsâ*. Schren. Gr. 34. Broad leaved Alpine Panicle Grass, with a sparsed Millet-like Panicle.

The 1st Sort grows naturally in India, but is now cultivated in many Parts of Europe, as an esculent Grain; this rises with a Reed-like Stalk, 3 or 4 Feet high, and is channelled; at every Joint there is one Reed-like Leaf, joined on the Top of the Sheath, which embraces and covers that Joint of the Stalk below the Leaf; this Sheath is closely covered with soft Hairs, but the Leaf which is expanded has none, that has several small longitudinal Furrows running parallel to the Mid-rib. The Top of the Stalk is terminated by a large loose Panicle, which hangs on one Side, having a chaffy Flower, succeeded by a small round Seed, often made into Puddings, &c. There are two Varieties of this, one with white, and the other hath black Seeds, but do not differ in any other Particular.

The 2d Sort grows naturally at La Vera Cruz; this has a slenderer Stalk than the former, which rises about 3 Feet high. The Sheaths which surround it have no Hairs, but are channelled. The Leaves are shorter than those of the former. The Panicle stands erect, and the Chaff has shorter Awne, or Beards.

The other two Sorts grow naturally in Woods, and are never cultivated in the Fields.

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The common Millet was originally brought from the Eastern Countries, where it is still greatly cultivated, from whence we are furnished annually with this Grain, which is by many Persons greatly esteemed for Puddings, &c. these are seldom cultivated in England, but by Way of Curiosity in small Gardens, or for feeding of Poultry, where the Seeds generally ripen very well.

They must be sown the Beginning of April, upon a warm dry Soil, but not too thick, because these Plants divide into several Branches, and should have much Room, and when they come up, they should be cleared from Weeds, after which they will, in a short Time, get the better of them, and prevent their future Growth. In August these Seeds will ripen, when it must be cut down, and beaten out, as is practised for other Grain; but when it begins to ripen, if it be not protected from Birds, they will soon devour it.

MILLEFOLIUM. See Achillea.

MILLERIA. Houst. Gen. Nov. Martyn. Cent. 4. Lin. Gen. Plant. 881.

The Characters are,

This hath a compound Flower, composed of several Florets, and one half Floret, which are included in one common Empalement of one Leaf, cut into three Parts, and is permanent. The hermaphrodite Florets have one tubulous Petal, which is erect, and indented at the Brim in five Parts; these have five hairy Stamina, with erect linear Summits connected in their Middle, to the Side, and are the Length of the Petal, and an oblong narrow Germen, supporting a slender Style, crowned by two narrow, obtuse, spreading Stigmas; these Florets are barren. The female half Floret is of one Leaf, stretched out on one Side like a Tongue, and is indented at the Top; this hath a large three cornered Germen, supporting a slender Style, crowned by two long bristly Stigmas. The Germen turns to an oblong, three-cornered, obtuse Seed, inclosed in the Empalement.

The Species are

1. MILLERIA foliis cordatis, pedunculis dichotomis. Hort. Cliff. 426. *Milleria* with Heart-shaped Leaves, and Foot Stalks arising from the Division of the Stalks. This is the *Milleria annua, erecta, major, floribus spicatis luteis*. Houst. Mss. Greater upright annual *Milleria*, and yellow spiked Flowers.

2. MILLERIA foliis infimis cordato-ovatis acutis rugosis, caulibus lanceolato-ovatis, acuminatis. *Milleria* whose lower Leaves are oval, Heart-shaped, acute-pointed, and rough, and the upper ones oval, Spear-shaped, and pointed. *Milleria annua erecta ramifera, foliis maculatis, profundius serratis*. Martyn. Dec. 5. Upright annual branching *Milleria* with spotted Leaves deeply sawed.

3. MILLERIA foliis ovatis, pedunculis simplicissimis. Hort. Cliff. 425. *Milleria* with oval Leaves, and single Foot Stalks. This is the *Milleria annua erecta minor, foliis parietariæ, floribus ex foliorum alis*. Houst. Mss. Smaller upright annual *Milleria* with a Pellitory Leaf, and Flowers proceeding from the Wings of the Leaves.

4. MILLERIA foliis ovato-lanceolatis acuminatis trinerviis, pedunculis alaribus. *Milleria* with oval, Spear-shaped, acute-pointed Leaves, having three Veins, and Foot Stalks proceeding from the Wings of the Leaves. This is the *Milleria annua erecta, foliis parietariæ longioribus, floribus ex foliorum alis*. Edit. Prior. Annual erect

Milleria

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Milleria with a longer Pellitory Leaf, and Flowers proceeding from the Wings of the Leaves.

5. *MILLERIA foliis lanceolatis rugosis, floribus confertis axillaribus.* *Milleria* with rough Spear-shaped Leaves, and Flowers growing in Clusters from the Wings of the Stalks.

The 1st Sort was discovered by the late Dr. *William Houstoun*, at *Campeachy*, in the Year 1731, from whence he sent the Seeds to *Europe*; and as the Characters which distinguish the Genus, were different from all the other Genera of the Class to which it belongs, so he constituted a new Genus with this Title.

This rises with an herbaceous branching Stalk, from 3 to 5 Feet, high garnished with Heart-shaped Leaves, about 4 Inches long, and 3 Inches broad toward their Base, drawing to a Point at the End, and are slightly sawed on their Edges, having two Veins on each Side the Mid-rib, which join to it near the Base, but diverge from it toward the Borders of the Leaves, and meet again at the Point, which generally is oblique to the Foot Stalk. The Leaves are of a light green, and hairy, standing by Pairs, opposite; their Foot Stalks are about an Inch long, and have a Part of the Leaf running on each Side, like Wings. The Stalks divide by Pairs, upward, and the Foot Stalks of the Flowers come out at the Divisions; these branch again by Pairs, and terminate in loose Spikes of yellow Flowers, composed of 4 or 5 hermaphrodite Florets, which are barren, and one female half Floret, which is succeeded by a single oblong angular Seed, wrapped in the Empalement of the Flower. It flowers in *July* and *August*, and the Seeds ripen in Autumn.

The 2d Sort was discovered by Mr. *Millar*, at *Campeachy*, in the Year 1734; this approaches near to the first Sort, but the Stalks rise 6 or 7 Feet high, and branch out very wide. The Leaves are 7 Inches long, and 4 and a Half broad toward their Base, ending in long acute Points; they are deeper sawed on their Edges, and have several large black Spots scattered over them; their Surface is rougher, and they are of a darker green than those of the first. The upper Leaves are long, and Spear-shaped; the Foot Stalks of the Flowers branch out wider, and the Spikes of Flowers are shorter than those of the first.

The 3d Sort was discovered at *Campeachy*, by the late Dr. *Houstoun*; this is an annual Plant, which rises with an herbaceous Stalk, upward of two Feet high, branching out at a small Distance from the Root, into 3 or 4 slender Stalks, which are naked almost to the Top, where they have two oval Spear-shaped Leaves, placed opposite, about two Inches long, and three Quarters of an Inch broad, near their Base, ending in Points; they are hairy, and stand upon naked Foot Stalks, near an Inch long, and are rough, having three longitudinal Veins, and are slightly indented on their Edges. The Flowers come out at the Foot Stalks of the Leaves, in small Clusters; the common Empalement is composed of 3 orbicular Leaves compressed together; in each of these are situated 2 or 3 hermaphrodite Florets, which are barren, and one female half Floret, which is fruitful, being succeeded by a roundish angular Seed, inclosed in the Empalement. This flowers and perfects Seeds about the same Time with the former.

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The 4th Sort was discovered by Mr. *Millar* at *Campeachy*; this is an annual Plant, which rises with an upright Stalk 3 or 4 Feet high, garnished the whole Length with oval Spear-shaped Leaves near 4 Inches long, and almost 2 broad near their Base; they have 3 longitudinal Veins, and toward the Top there are 2 more which diverge from the Mid-rib, but join again at the Point. The upper Side of the Leaves are of a dark green and smooth, their under Sides are of a pale green, and they are indented on their Edges. The Flowers grow from the Wings of the Leaves in small Clusters, standing upon short Foot Stalks; these have Empalements like the former, but they are much smaller, in each of which are situated two hermaphrodite Florets which are barren, and one female half Floret which is fruitful. This flowers and seeds later in the Year than either of the former, so that unless the Plants are brought forward in Spring, they will not ripen their Seeds in *England*.

The fifth Sort was discovered by Mr. *Millar* at *Campeachy*; this rises with a pretty strong channelled Stalk near 4 Feet high, divided into Branches by Pairs; these are garnished with Spear-shaped Leaves, about 3 Inches long and one broad in the Middle, ending in acute Points; they are rough, and their Edges entire. The Flowers come out at every Joint the whole Length of the Branches, in very close Clusters of Flowers, each containing upward of twenty, so that the Branches are almost covered with them; these have orbicular compressed Empalements, which have Borders to them, and are smaller than those of either of the two former. Their Leaves are equal, and in each of the Empalements are situated two hermaphrodite Florets which are barren, and one half Floret which is female and fruitful. This is also late in flowering, unless the Plants are brought forward early in Spring.

The Seeds of these Plants should be sown early in the Spring, on a moderate hot Bed; and when the Plants are come up about two Inches, they should be each transplanted into a separate Pot filled with light rich Earth, and then plunged into a moderate hot Bed of Tanners Bark, being careful to shade them from the Sun until they have taken Root, as also to water them frequently. After the Plants are rooted, they should have a large Share of free Air admitted to them, by raising the Glasses of the hot Bed every Day when the Weather is fair; and they must be watered every Day in hot Weather, being very thirsty Plants. With this Management, they will, in a Month after transplanting, rise to a considerable Height; therefore they should be shifted into larger Pots, and placed in the Stove, plunging them into the Bark Bed, where they may have Room to grow, especially the 1st and 2d Sorts, which usually grow high, and branch out, where they are well managed. But the other Sorts seldom rise above 3 or 4 Feet high, and do not spread their Branches very far, so these may be allowed less Room.

In the Middle of *July* they will begin to flower, and the Seeds ripen about a Month after; they must be gathered when they begin to change of a dark brown Colour, especially those of the two large Kinds, which will drop on the least Touch when they are ripe. These Plants continue flowering till *Michaelmas*, or later, if the Season

proves favourable; but when the Cold of Autumn comes on, they soon decay.

MIMOSA. Tourn. Inst. R. H. 605. Tab. 375. Lin. Gen. Plant. 597. The sensitive Plant.

The Characters are,

The Empalement is small, of one Leaf, indented in 5 Parts at the Top: The Flower has one Funnel-shaped Petal, which hath 5 Points. It hath many long hairy Stamina, terminated by prostrate Summits, and an oblong Germen supporting a short slender Style, crowned by a truncated Stigma. The Germen turns to a long jointed Pod with several transverse Partitions, inclosing compressed roundish Seeds.

The Species are,

1. MIMOSA inermis, foliis bipinnatis, spicis cernuis, floribus decandris, inferioribus castratis apetalis. Flor. Zeyl. 505. Smooth sensitive Plant with double winged Leaves, nodding Spikes of Flowers, having ten Stamina, and the lower without either Stamina or Petals. This is the *Mimosa Jamaicensis*. Zan. Hist. 144 Sensitive Plant of Jamaica.

2. MIMOSA inermis, foliis bipinnatis, spicarum floribus pentandris, inferioribus plenis. Hort. Upsal. 145. Smooth sensitive Plant with double winged Leaves, the Flowers of the Spikes with five Stamina, and the under ones double. This is the *Mimosa non spinosa, palustris* & herbacea, procumbens, flore luteo pleno. Houst. Mss. Herbaceous Marsh trailing sensitive Plant without Spines, and a double yellow Flower.

3. MIMOSA inermis decumbens, foliis bipinnatis, spicis cernuis, floribus pentandris, inferioribus castratis. Hort. Upsal. 145. Smooth sensitive Plant with inclining Stalks, double winged Leaves, nodding Spikes of Flowers having five Stamina, but the under ones without any. This is the *Mimosa spuria de Pernambuco, dicta mimosa Italica*. Zan. Hist. 151. Spurious sensitive Plant of Pernambuco, called Italian sensitive Plant.

4. MIMOSA aculeata, foliis pinnatis, caule procumbente villoso, siliquis articulatis. Prickly sensitive Plant with winged Leaves, a hairy trailing Stalk, and jointed Pods. This is the *Mimosa herbacea procumbens*, & spinosa, caule tereti & villoso, siliquis articulatis. Houst. Mss. Trailing herbaceous sensitive Plant having Spines, with a taper and hairy Stalk, and jointed Pods.

5. MIMOSA foliis subdigitatis pinnatis, caule aculeato hispido. Lin. Sp. Plant. 518. Sensitive Plant with winged handed Leaves, and a prickly hairy Stalk. This is the *Mimosa spinosa tertia*, five foliolis acaciae angustioribus, siliquis parvis ebinatis. Breyn. Cent. 1. 40. The third prickly sensitive Plant, with narrow Acacia Leaves, and small prickly Pods.

6. MIMOSA foliis subdigitatis pinnatis, caule aculeato decumbente, siliculis confertis, involucriis hispidis. Sensitive Plant with winged handed Leaves, a prickly declining Stalk, and small Pods growing in Clusters, with prickly Coverings. This is the *Mimosa bumilis frutescens* & spinosa, siliquis conglobatis. Plum. Cat. Low shrubby and prickly sensitive Plant with clustered Pods, commonly called the Humble Plant.

7. MIMOSA aculeata foliis bipinnatis caule quadrangulo, aculeis recurvis, leguminibus quadrivalvibus. Lin. Sp. Plant. 522. Prickly sensitive Plant with double winged Leaves, a four cornered Stalk, recurved Spines, and Pods having four Valves: This the *Mimosa ber-*

bacea procumbens, & spinosa, caule quadrangulo, siliquis quadrivalvibus. Houst. Mss. Trailing and prickly herbaceous sensitive Plant, with a quadrangular Stalk, and Pods having four Valves.

8. MIMOSA foliis conjugatis pinnatis, partialibus bijugis, intimis minimis, caule aculeato. Lin. Sp. Plant. 518. Sensitive Plant, with conjugated winged Leaves, whose Wings have two Pair of Lobes, the inner of which are the least, and a prickly Stalk. This is the *Mimosa spinosa prima*, five *Brasiliana latifolia*, siliquis radiatis. Breyn. Cent. 1. 31. The first prickly, or broad leaved sensitive Plant of the Brazils, with radiated Pods.

9. MIMOSA caule fruticoso, foliis bipinnatis, aculeatis, aculeis geminis, siliquis radiatis birsutis. Fig. Plant. Tab. 183. fol. 3. Sensitive Plant with a shrubby Stalk, double winged prickly Leaves, whose Spines grow in Pairs, and hairy radiated Pods. This is the *Æschynomene spinosa quarta*, five foliolis acaciae angustioribus, frondibus vultuissimas spinas habentibus. Breyn. Cent. 1. 43. The fourth prickly sensitive Plant, with narrow Acacia Leaves, armed with strong Spines.

10. MIMOSA caule inermi herbaceo repente, foliis conjugatis pinnatis, floribus globosis alaribus. Sensitive Plant with a creeping herbaceous unarmed Stalk, conjugated winged Leaves, and globular Flowers proceeding from the Wings of the Stalks. *Mimosa herbacea non spinosa, minima, repens*. Sloan. Hist. Jam. 2. p. 58. The least creeping herbaceous sensitive Plant, having no Spines.

The 1st Sort grows naturally in most of the Islands in the West-Indies, and it has been found in some warm moist Spots as far North as Virginia. This rises with upright, branching Stalks 6 or 7 Feet high, which become ligneous toward the Root, but are not perennial (at least they are not so here in any Situation, the Plants always decaying in Winter;) these are smooth, and garnished with double winged Leaves, composed of 4 or 5 Pair of long winged Lobes, which have about 20 Pair of small Leaves ranged along the Mid-rib; they are smooth and rounded at their Points, of a full green on their upper Side, but pale on their under. These small Leaves contract themselves together on being touched, but the Foot Stalks do not decline at the same Time, as those do which are titled Humble Plants, so this is called the sensitive Plant by Way of Distinction. The Flowers are produced on long Foot Stalks, which come out from the Wings of the Leaves, and are disposed in globular Heads which nod downward; they are yellow, and all those which have Petals, have 10 Stamina in each, but those situated round the Border, have neither Petals or Stamina; those on the upper Part of the Spike are succeeded by Pods an Inch and a Half long, and a Quarter of an Inch broad, which change to a dark brown when ripe, inclosing 3 or 4 compressed shining black Seeds.

The 2d Sort was discovered by Dr. Housloun at La Vera Cruz, growing in stagnant Waters, where the Stalks were very broad and flat, and floated on the Surface, as Pond Weeds do; but in those Places where the Water was dried up, the Stalks grew upright and were round, which is always the Case when the Plants are cultivated in Gardens, so that they might easily pass for different Plants, to those who never saw them growing in both Situations. When this Sort is cultivated

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in Gardens, it greatly Resembles the first, but the Stalks of this never grow so erect, the Wings of the Leaves are longer, and stand more horizontal; the Heads of Flowers are much larger, the Stamina longer, and the Flowers on the under Side of the Spike which have no Stamina are double: The Pods of this are shorter, and much broader than those of the first Sort. This is also an annual Plant in this Country. This Sort was since discovered by a Friend of mine, growing naturally in a marshy Spot of Land in the Island of *Barbuda*, from whence he sent me the Seeds, with a large Branch of the Plant in a Glass filled with a Lixivium, which preserved it in the State it was gathered, with the Flowers and Pods upon it.

The 3d Sort grows naturally in all the Islands of the *West-Indies*, where it is titled the slothful sensitive Plant, because the Leaves do not contract on their being touched. The Stalks of this seldom rise more than two Feet and a Half high, they are smooth and garnished with double winged Leaves, composed of 3 or 4 Pair of Wings which are shorter, and the small Leaves are much narrower than those of the two former Sorts; the Heads of Flowers are smaller, and the Pods longer and narrower than those of the other. This Sort will live through the Winter in a moderate warm Air.

The 4th Sort was discovered by *Dr. Houston*, growing naturally at *La Vera Cruz*. This hath ligneous Stalks which decline to the Ground, spreading out 2 or 3 Feet from the Root, and send out several Side Branches; these are armed with short yellowish Spines under the Foot Stalks of the Leaves, and are their whole Length closely covered with bristly stinging Hairs; the Foot Stalks of the Leaves are 3 Inches long and at the Top sustain 4 single winged Leaves, whose Base meet in a Point, but spread above like the Fingers of an open Hand. These Wings are about 3 Inches long, closely garnished with small narrow Lobes, set by Pairs along the Mid-rib, which is also covered on the under Side, with the like bristly Hairs as the Stalk. The Flowers come out from the Wings of the Leaves upon pretty long Foot Stalks, they are collected into globular Heads, and are of a pale yellowish Colour; these are succeeded by small jointed Pods, containing 2 or 3 shining black Seeds.

The 5th Sort grows naturally at *Campeachy*. This hath ligneous declining Stalks armed with Thorns, and covered with stinging bristly Hairs; the Leaves are composed of 4 Wings, which join at their Base, where they are inserted to the Foot Stalk, spreading out like the Fingers of an open Hand; these Wings are much shorter than those of the former, and the small Leaves or Lobes are broader. The Flowers come out from the Wings of the Stalk on long Foot Stalks, growing in oval Heads; they are white, and are succeeded by small prickly Pods. This is one of those Species, whose Foot Stalks fall upon being touched.

The 6th Sort is the most common of any in the Islands of the *West Indies*, as also in the *English* Gardens; the Seeds of this are frequently sold in the Shops by the Title of Humble Plant. The Roots are composed of a great Number of hairy Fibres, which mat close together, from which come out several ligneous Stalks which naturally decline toward the Ground, unless supported;

they are armed with short recurved Spines, and garnished with winged Leaves composed of 4 and sometimes 5 Wings, whose Bases join at a Point, where they are inserted to the Foot Stalk, spreading upward like the Fingers of a Hand; these Wings are shorter than those of the former Sort, and the Stalks are not hairy. The Flowers come out from the Wings of the Stalks on short Foot Stalks; they are collected in small globular Heads, are yellow, and are succeeded by short, flat, jointed Pods, which have 2 or 3 orbicular, bordered, compressed Seeds in each: These Pods are in close Clusters almost covered with stinging hairy Covers.

The 7th Sort grows naturally at *La Vera Cruz*. This hath a perennial creeping Root, which spreads and multiplies greatly in the Sands, where it grows wild; the Stalks are slender and have 4 acute Angles, armed with short recurved Spines; the Leaves stand on long prickly Foot Stalks, which are thinly placed on the Branches; they are composed of 2 Pair of Wings, standing about an Inch asunder; the Wings are short, and the small Leaves are narrow, and not placed so close together, as in many of the other Species. The Foot Stalks of the Flowers come out from the Wings of the Leaves, sustaining a small globular Head of purple Flowers; these are succeeded by four cornered Pods about 2 Inches long, which have 4 Cells, opening with four Valves containing several angular Seeds in each.

This Sort spreads so much at the Root, as to render it not so productive of Flowers and Seeds, as most of the others; the Plants propagated by parting the Roots, are always weak, so the best Way is to propagate them by Seeds, when they can be obtained. This is one of the Sorts whose Foot Stalks fall on being touched.

The eighth Sort grows naturally at *La Vera Cruz*, from whence *Dr. Houston* sent the Seeds. This rises with a slender ligneous Stalk, 7 or 8 Feet high, armed with short recurved Thorns. The Leaves grow on long Foot Stalks which are prickly, each sustaining 2 Pair of Wings; the exterior Pair have two Lobes which join at their Base, and are rounded on their Outside; but strait on their inner Edges, very much shaped like a Pair of those Shears, used for shearing of Sheep; these two outer Pair of Lobes are much larger than the inner; they are almost two Inches long, and one broad in the Middle. From the Place where these are inserted to the Stalk, come out small Branches which have 3 or 4 globular Heads of pale purple Flowers coming out from the Side, upon short Foot Stalks, and the principal Stalk has many of these Heads or Flowers on the upper Part for more than a Foot in Length; and this, as also the Branches, are terminated by the like Heads of Flowers: These are succeeded by broad, flat, jointed Pods, which open with two Valves, some having but one, others two, and some have three orbicular compressed Seeds. The Leaves of this Sort move but slowly when touched, but the Foot Stalks fall when they are pressed pretty hard.

The 9th Sort was also found growing naturally at *La Vera Cruz*. This hath a shrubby erect Stalk, about 5 Feet high, which is hairy, and armed with short, broad, strong Thorns, which are white, standing on each Side sometimes almost opposite, and at others alternately. The Leaves are composed of five or six Pair of Wings, which are ranged opposite along a strong Mid-rib, and

between each Pair are placed two short strong Spines, pointing out each Way. The small Leaves which compose these Wings are extremely narrow, and stand very close to each other. Toward the upper Part of the Stalk, the Flowers are produced from the Sides, upon short Foot Stalks; they are collected into globular Heads, and are of a bright purple Colour; the Stalks are also terminated by smaller Heads of the like Flowers. These are succeeded by flat jointed Pods about 2 Inches long and a Quarter of an Inch broad, which spread open like Rays, there being commonly 5 or 6 of these joined together at their Base to the Foot Stalk. These Pods separate at each Articulation, leaving the two Side Membranes or Borders standing, and the Seeds which are compressed and square, drop out from the Joints of the Pods; these Pods are hairy at first, but as they ripen become smooth.

This is a perennial Plant, which may be preserved through the Winter in a warm Stove, by which Method the Seeds may be obtained, for it seldom flowers, the first Year. The Foot Stalks do not fall on being touched, but the small Leaves on the Wings close up.

The 10th Sort grows naturally in *Jamaica*; this hath trailing herbaceous Stalks, which put out Roots at every Joint, which fasten in the Ground and spread to a great Distance, as they will also do here, when placed in a Bed of Tanners Bark. I have had a single Plant in one Summer, which has spread near 3 Feet square, whose Branches were closely joined so as to cover the Surface of the Bed; but when they are thus permitted to grow, they seldom produce Flowers. These Stalks have no Thorns, but are garnished with winged Leaves, composed of 2 Pair of short Wings, whose small Leaves or Lobes are narrow; these stand on short smooth Foot Stalks. The Leaves of this contract and fall on the least Touch, so that where the Plant is extended to a Distance a person may draw any Figure with a Stick upon the Leaves, which will be very visible till they recover again. The Flowers come out from the Wings of the Leaves, upon naked Foot Stalks about an Inch in Length; they are of a pale yellowish Colour, and are collected into small globular Heads; these are succeeded by short, flat, jointed Pods, containing 3 or 4 compressed roundish Seeds.

These Plants are all propagated by Seeds, which should be sown early in Spring on a good hot Bed. If the Seeds are good, the Plants will appear in a Fortnight or three Weeks, when they will require to be treated with Care, for they must not have much Wet till they have acquired Strength; nor should they be drawn too weak, so that fresh Air should be admitted to them, at all Times when the Air is temperate. In about a Fortnight or three Weeks after the Plants come up, they will be fit to transplant, especially if the Bed in which they were sown, continues in a proper Degree of Heat; then there should be a fresh hot Bed prepared to receive them, which should be made a Week before the Plants are removed into it, that the violent Heat may be abated before the Earth is laid upon the Dung, and the Earth should have Time to warm before the Plants are planted into it. Then the Plants must be carefully raised up from the Bed to preserve the Roots entire, and immediately planted in the new Bed, at about 3 or 4 Inches Distance,

Pressing the Earth gently to their Roots; then they should be gently sprinkled over with Water to settle the Earth to their Roots; after this they must be shaded from the Sun till they have taken new Root, and the Glasses of the hot Bed should be covered every Night, to keep up the Heat of the Bed. When the Plants are established in their new Bed, they must have frequent, but gentle Waterings; and every Day they must have free Air admitted, in Proportion to the Warmth of the Season, to prevent their being drawn up weak; but they must be constantly kept in a moderate Degree of Heat, otherwise they will not thrive. In about a Month after the Plants will be strong enough to remove again, when they should be carefully taken up, preserving as much Earth to their Roots as possible, and each planted in a separate small Pot, filled with good Kitchen Garden Earth, and plunged into a hot Bed of Tan, carefully shading them from the Sun till they have taken new Root, then they must be treated in the same Manner as other tender exotick Plants from very warm Countries.

The Sorts which grow upright and tall, will soon rise high enough to reach the Glasses of the hot Bed, especially if they thrive well; therefore they should be shifted into larger Pots, and removed into the Stove, and if they are plunged into the Tan Bed there, it will greatly forward them. The 1st Sort will often flower here, if the Plants are raised early in Spring, and brought forward by their Removal from one hot Bed to another, and 2 or 3 Times I have had their Seeds ripen, but this can only be expected in very warm Seasons.

The perennial Sorts will live through the Winter in a warm Stove, and the following Summer will produce Flowers and ripen Seeds. Some of these may be propagated by Laying their Branches, which will put out Roots, and then may be separated from the old Plants; I have sometimes propagated them by Cuttings, but the Seedling Plants are preferable to either of these.

These Plants require no particular management, different from others of the same warm Countries; the great Care is to keep them in a proper Temperature of Heat, and not to give them too much Water, especially in cool Weather; nor should they be kept too dry, for many of the Sorts require frequent Waterings, as they naturally grow in moist Places. There should also be Care taken that they do not root into the Tan Bed, for they soon put out their Roots through the Holes at the Bottom of the Pots, which, when they strike into the Tan, will cause the Plants to grow very luxuriant; but when they are removed, and these Roots are cut or broken off, the Plants seldom survive; therefore the Pots should be frequently drawn out of the Tan, and if any of the Roots are beginning to get through the Holes at the Bottom, they should be cut off close; and when the Roots are very closely matted together, they should be turned out of the Pots, and pared round to reduce them, then potted again, either in Pots of the same Size, or if the Plants require, in Pots one Size larger; but they must not be over-potted, for then the Plants will not thrive.

Some of those Sorts whose Stalks spread near the Ground, may be turned out of the Pots in the Middle of *June*, and planted in a very warm Border, where, if they are covered with Bell or Hand Glasses, they will live

live through the Summer; but these will not grow very large, and upon the Approach of Cold in Autumn, are soon destroyed; however, those who have not Convenience of Stoves or Tan Beds, may raise the Plants on common hot Beds in Spring; and when they have acquired Strength, they may be treated in this Manner, whereby they will have the Plants in Summer, though not in so great Perfection, as those which have the Advantages before mentioned: For these Plants will not thrive in the open Air in this Country, nor will they retain their Sensibility when fully exposed to the Air.

It would be to little Purpose to trouble the Reader with the several idle Stories related of these Plants by Travellers, nor to insert what has been said by others, who have attempted to account for the Motion of the Leaves on being touched, since there has not been any Thing wrote on this Subject, worthy of being noticed, that I have yet seen; I shall therefore only mention what I have myself observed in these Plants, for more than thirty Years that I have cultivated them.

The first is, that they are more or less susceptible of the Touch or Pressure, according to the Warmth of the Air in which they grow; for those Plants which are kept in a warm Stove, contract their Leaves immediately on being touched, either with the Hand, a Stick, or any other Thing, or by the Wind blowing upon them: Some of the Sorts only contract their small Leaves, which are placed along the Mid-rib; others not only contract these small Leaves, but the Foot Stalk also declines downward on being touched: The first are called *sensitive*, and the second *bumble Plants*; but when these Plants are placed in a cooler Situation, they do not move so soon nor contract so closely, as those which are in a greater Warmth; and those which are entirely exposed to the open Air, have very little Motion, but remain in one State, neither expanded nor closed, but between both, especially in cool Weather; nor do these shut themselves at Night, as those do which are in a warm Temperature of Air.

The second is, that it is not the Light which causes them to expand, as some have affirmed who have had no Experience of these Things; for in the longest Days of Summer, they are generally contracted by five or six in the Evening, when the Sun remains above the Horizon two or three Hours longer; and although the Glasses of the Stove in which they are placed, is covered close with Shutters to exclude the Light in the Middle of the Day, yet if the Air of the Stove is warm, the Leaves of the Plants will continue fully expanded, as I have several Times observed. Nor do these Plants continue shut till the Sun rises in the Morning, for I have frequently found their Leaves fully expanded by the Break of Day in the Morning; so that it is plain the Light is not the Cause of their Expansion, nor the Want of it that of their Contraction.

I have also observed, that those Plants which are placed in the greatest Warmth in Winter, continue vigorous, and retain their Faculty of contracting on being touched; but those which are in a moderate Warmth, have little or no Motion.

When any of the upper Leaves of these Plants are touched, if they fall down and touch those below them, it will occasion their contracting and falling, so that

by one touching another, they will continue falling for some Time. When the Air of the Stove in which these Plants stand, is in a proper Temperature of Warmth, the Plants will recover themselves and their Leaves will be fully expanded in about eight or ten Minutes. I have frequently watched them as they have been recovering, and have always found it has been by a Vibratory Motion, like the Index of a Clock.

Some of the Sorts are so susceptible of the Touch, that the smallest Drop of Water falling on their Leaves will cause them to contract, but others do not move without a much greater Pressure.

The Roots of all the Sorts have a very strong disagreeable Odour, almost like that of a common Sewer, I have met with some Accounts of these Plants, in which it is mentioned, that the Leaves and Branches have a poisonous Quality; and that the *Indians* extract a Poison from them, which kills by slow Degrees, and that the Root of the Plant is the only Remedy to expel it; but how far this is true I cannot say, having never made any Experiments on the Qualities of these Plants; but if these Plants are endued with so deadly a Quality as related, this Sensibility with which they are endued, may be designed by Providence to caution Persons from being too free with it; and as many of them are strongly armed with Thorns, so that is a Guard against their being eaten by Animals; for in all the Enquiries which I have made of those Persons who have resided in the Countries where they naturally grow, I could never learn that any Animal will browse upon them.

These Plants are all of them Natives of *America*, so were unknown to the other Parts of the World till that was discovered, for I have not heard of any of them being found in any other Country; and a few Years ago I sent some of the Seeds of these Plants to *Cbina*, which succeeded, and occasioned great Admiration in all who saw the Plants.

MIMULUS. *Lin. Gen. Plant.* 701. *Cynophyllum*. *Mitch.* 3.

The Characters are,

The Flower hath an oblong, five cornered, permanent Emplacement of one Leaf; it is of the Lip or ringent Kind, having one Petal, whose Tube is the Length of the Emplacement, and the Brim is divided in two Lips. The upper Lip is erect, divided at the Top in two Parts, which are reflexed on their Side; the lower Lip is broad and trifid, the middle Segment is the least; the Palate is convex and bifid. It has four slender Stamina, two longer than the other, terminated by bifid Kidney-shaped Summits, and a conical Germen supporting a slender Style, crowned by an oval, bifid, compressed Stigma. The Germen turns to an oval Capsule with two Cells, filled with small Seeds.

We have but one Species of this Genus, viz.

MIMULUS. *Hort. Upsal.* 176. This is the *Digitalis perfoliata* glabra, flore violaceo minore. *Mor. Hist.* Smooth perfoliated Foxglove, with a small Violet Flower.

This Plant grows naturally in *North America*, in moist Ground. It has a perennial Root and annual Stalk, which decays in Autumn; the Stalk is square, and rises a Foot and a Half high, garnished at each Joint with two oblong smooth Leaves, which are broadest at their Base, where they join round the Stalk, but end in acute Points. The lower Part of the Stalk sends out.

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out 2 or 3 short Branches, and the upper Part is adorned with two Flowers at each Joint, coming from the Bottom of the Leaves on each Side the Stalk; these have an oblong curved Empalement with 5 Angles, indented at the Top in 5 Parts, out of which arises the Flower, with a long curved Tube, spreading open at the Top into 2 Lips; the upper Lip standing erect, which is slightly cut into two Parts at the Top; the under Lip turns downward, and is cut into three slight Segments. The Flowers are of a Violet Colour, but have no Scent. These appear in July, and are succeeded by oblong Capsules with two Cells, filled with small Seeds which ripen in Autumn.

This Plant is very hardy in Respect to Cold, but should have a loamy soft Soil, rather moist than dry, and not too much exposed to the Sun. It may be propagated by parting the Roots in Autumn, but they should not be divided too small; it may also be propagated by Seeds, which should be sown in Autumn, soon after they are ripe, for those which are sown in the Spring, seldom grow the same Year; these may be sown on a Border exposed to the Morning Sun.

MINIONET, or MIGNONNETTE. See Refeda.

MINT. See Mentha.

MIRABILIS. *Lin. Gen. Plant.* 215. *Jalapa. Tourn.* *Inst.* Marvel of Peru, or Four o'Clock Flower.

The Characters are,

The Empalement of the Flower has five, oval, Spear-shaped, small Leaves, and is erect, swelling, and permanent. The Flower has one Funnel-shaped Petal, with a long slender Tube fitting upon the Nectarium, which spreads open above, and is cut into five obtuse Segments. It hath five slender Stamina, which adhere to the Petal, which are unequal and inclined, terminated by roundish Summits, with a roundish Germen within the Nectarium, supporting a slender Style, crowned by a globular Stigma. The Germen afterward becomes an oval five cornered Nut, inclosing one Seed.

The Species are,

1. MIRABILIS caule erecto, floribus amplioribus. Marvel of Peru with an erect Stalk, and large Flowers. This is the *Jalapa flore purpureo. Tourn. Inst.* 129. Jalap with a purple Flower.

2. MIRABILIS caule erecto, geniculis tumentibus parvo flore. Marvel of Peru with an erect Stalk, swelling Joints, and a small Flower. *Jalapa officinarum, fructu rugoso. Tourn.* Jalap of the Shops, with a rough Fruit.

3. MIRABILIS caule decumbente, villosa & viscosa; tubo floris longissimo, fructu rugoso. Marvel of Peru with a declining, hairy, viscous Stalk, a very long Tube to the Flower, and a rough Fruit. *Jalapa Mexicana, tubo floris longissimo. Monier.* Hairy and glutinous Jalap of Mexico, having a very long Tube to the Flower.

The 1st Sort is the Marvel of Peru, which has been many Years cultivated in the English Gardens for Ornament; of this there are several Varieties, which differ in the Colour of their Flowers; two of these are always different, one of them has purple and white Flowers, which are variable, some of them are plain purple, others are plain white, but most of them are variegated with the two Colours, and all these Varieties are sometimes upon the same Plant, and at others on different Plants; the other has red and yellow Flowers, which are generally mixed in the same Flowers, but are often with

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plain Flowers of both Colours on the same Plant, intermixed with those which are variegated; but some Plants have only plain Flowers; and I have never found that the Seeds of the purple and white Sort, ever produced the yellow and red, nor the latter ever vary to the former, and I have constantly cultivated both more than forty Years; but although these do not change from one to the other, yet as there is no other Difference between them, than in the Colour of their Flowers, I have not enumerated them as distinct Species.

The 2d Sort is very common in all the Islands of the West-Indies, where the Inhabitants call it the Four o'Clock Flower, from the Flowers opening at that Time of the Day. Of this Sort I have never seen any with variable Flowers; they are of a purplish red Colour, and not much more than half the Size of the other. The Stalks of this have thick swollen Joints; the Leaves are smaller, and the Fruit is very rough, so there can be no doubt of their being distinct Species, for I have never seen any alteration in this from Seed, and I have cultivated it more than 30 Years. *Tournefort* was informed by Father *Plumier*, that the Root of this Plant was the official Jalap, upon which he constituted the Genus, and gave that Title to it; but Dr. *Houssoun* was fully informed in the Spanish West-Indies of the contrary, and brought over a Drawing of the Plant which was made by a Spaniard at *Halapa*, and he carried 2 or 3 of the Plants to *Jamaica*, where he planted them in a Garden, but after he left the Island, they were destroyed by Hogs; however he was fully satisfied of its being a *Convulvulus*; indeed the Roots of Marvel of Peru are purgative, and when given in a double Quantity for a Dose, will answer the Purpose of Jalap.

The 3d Sort was sent from Mexico, a few Years since. The Seeds of this were first sent me from Paris, by Dr. *Monier*, of the Royal Academy of Sciences; and afterward I had some sent me from Madrid, by Dr. *Hortega*. The Stalks of this Sort fall on the Ground, if not supported; they grow about 3 Feet long, and divide into several Branches, garnished with Heart-shaped Leaves, placed opposite; these, as also the Stalks, are hairy and viscous, sticking to the Fingers of those that handle them. The Flowers come out at the End of the Branches; they are white, and have very long slender Tubes, and a faint musky Odour; these are like the other Sorts, closely shut all the Day, but expand every Evening when the Sun declines. The Seeds of this are larger than those of any other Species, and are as rough as those of the second Sort.

The two Varieties of the 1st Sort are very ornamental Plants in Gardens, during the Months of July, August, and September, and if the Season continues mild, they often last till near the End of October. The Flowers do not open till toward the Evening, while the Weather continues warm, but in moderate cool Weather, when the Sun is obscured, they continue open almost the whole Day. The Flowers are so plentifully produced at the Ends of the Branches, as that when they are open, the Plants seem entirely covered with them, and there being some plain, and others variegated on the same Plants, they make a fine Appearance.

These Plants are propagated by Seeds, in the Choice of which there should be Care taken not to save any from

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from those Plants, whose Flowers are plain; and those who are desirous of having only the variegated Kinds, are careful to pull off all the plain Flowers from those Plants which they intend for Seeds, to prevent them from having any Seeds, by this Method they rarely have any Plants with plain Flowers.

The Seeds should be sown on a moderate hot Bed in March, and when the Plants come up, they should have Plenty of Air admitted to them, when the Weather is mild, to prevent their being drawn up weak, and when they are about two Inches high, they should be transplanted on another very moderate hot Bed; or if they are each planted in a small Pot filled with light Earth, and plunged into a moderate hot Bed, it will be a more secure Way, for then there will be no Danger in shaking them out of the Pots, when they are to be planted in the Borders, so as to preserve all the Earth to their Roots; by this Method they will not require to be shaded, whereas those which are to be transplanted from the second hot Bed to the Borders, often rise with little Earth to their Roots, so must be carefully shaded, otherwise they often miscarry.

When they are in the second hot Bed, they should be shaded till they have taken fresh Root, after which they must have Plenty of free Air, to prevent their being drawn up weak; and in May they must be gradually inured to bear the open Air. The Beginning of June, if the Season is favourable, they should be transplanted into the Borders of the Pleasure Garden, giving them proper Room, and after they have taken new Root, they will require no further Care. If these Seeds are sown in a warm Border the Beginning of April, they will grow very well, but the Plants will flower late.

As the Seeds of these Plants ripen very well every Year, there are not many who take the Trouble of preserving their Roots; but if these are taken out of the Ground in Autumn, and laid in dry Sand all the Winter, secured from Frost, and planted again in the Spring, they will grow much larger, and flower earlier than the seedling Plants; or if the Roots are covered in Winter with Tanners Bark, to keep out the Frost, they may remain in the Borders, provided the Soil be dry. If the Roots which are taken out of the Ground, are planted the following Spring in large Pots, and plunged into a hot Bed, under a deep Frame, they may be brought forward, and raised 4 or 5 Feet High as I have frequently practised, and these Plants have come early in the Season to flower, so have been intermixed with other ornamental Plants, to decorate Halls, and shady Courts, where they have appeared very beautiful.

The other two Species require the same Treatment, but the 2d Sort is not so hardy as the other two, so unless the Plants are brought forward in the Spring, they will not flower till very late, and will not ripen Seeds.

MISLETOE. See Viscum.

MITELLA. Tourn. Inst. R. H. 241. Tab. 126. Lin. Gen. Plant. 496. Bastard American Sanicle.

The Characters are,

The Flower has a Bell-shaped Empalement of one Leaf, cut into 5 Points, which is permanent. It hath 5 Petals, ending in many hairy Points, and are inserted in the Empalement, as are also the ten Awl-shaped Stamina, which are shorter than the Petals, and terminated by roundish

Summits. It hath a roundish Germen, which is bifid, with scarce any Style, crowned by two obtuse Stigmas. The Empalement afterward becomes an oval Capsule with one Cell, opening with two Valves, filled with small Seeds.

The Species are,

1. MITELLA *scapo diphylla*. Lin. Gen. Nov. 29. Mitella with Flower Stalks having two Leaves. This is the *Mitella Americana*, *florum petalis fimbriatis*. Tourn. Inst. 242. American Mitella with fringed Petals to the Flowers.

2. MITELLA *scapo nudo*. Amœan. Acad. 2. p. 252. Mitella with a naked Stalk.

The 1st Sort grows naturally in the Woods of North America. It has a perennial Root, from which come out many Heart-shaped angular Leaves, some of which are obtuse, and others end in acute Points; they are indented on their Edges, and of a lucid green, a little hairy, and stand on pretty long Foot Stalks. The Flower Stalks rise immediately from the Root, having 2 or 3 angular Leaves toward the Bottom, and about the Middle of the Stalk come out 2 small Leaves, with acute Angles, placed opposite. The Stalks rise 8 or 9 Inches high, and are terminated by a loose Spike of small whitish Flowers, whose Petals are fringed on their Edges; these appear the Beginning of June, and are succeeded by roundish Capsules, filled with small Seeds.

The 2d Sort grows naturally in the northern Parts of Asia; this is of humbler Growth, seldom rising more than five or six Inches high. The Leaves are not so angular as those of the first Sort, and the Flower Stalks are always naked, having no Leaves. The Spikes of Flowers are shorter, and more compact.

Both these are propagated by parting their Roots; the best Time for this is in Autumn; they should be planted in a shady Situation, and love a soft loamy Soil.

MITELLA MAXIMA. See Bixa.

MOLDAVICA. See Dracocephalum.

MOLLE. See Schinus.

MOLLUGO. Lin. Gen. Plant. 99.

The Characters are,

The Empalement of the Flower is composed of 5 oblong small Leaves, coloured on their Inside, and permanent. The Flower has 5 oval Petals, shorter than the Empalement, and 3 bristly Stamina, which stand near the Style, and are terminated by single Summits, with an oval Germen, having 3 Furrows, supporting 3 very short Styles, crowned by obtuse Stigmas. The Germen becomes an oval Capsule with 3 Cells, filled with small Kidney-shaped Seeds.

The Species are,

1. MOLLUGO *foliis verticillatis cuneiformibus acutis, caule subdiviso decumbente, pedunculis unifloris*. Hort. Upsal. 24. Mollugo with acute Wedge-shaped Leaves, growing in Whorls, a trailing divided Stalk, and Foot Stalks bearing a single Flower. This is the *Alfne procumbens, galii facie Africana*. Hort. Lugd. Trailing African Chickweed with the Appearance of Ladies Bedstraw.

2. MOLLUGO *foliis quaternis obovatis, panicula dichotoma*. Hort. Cliff. 28. Mollugo with four Leaves at each Joint, which are almost oval, and a Panicle arising at the Division of the Branches. *Herniaria alfinis folio*. Tourn. Rupturewort with a Mouse Ear Leaf.

There are two or three Species of this Genus, which are rarely admitted into Gardens.

Both these Sorts are annual; the 1st is a Native of warm.

warm Countries, so is less hardy than the second; they are both trailing Plants, whose Stalks trail flat on the Ground; the first spreads out 8 or 9 Inches every Way, and at each Joint is garnished with 6 or 7 small Leaves spread out in Form of a Star. The Flowers are small, like those of Chickweed, one standing upon each Foot Stalk; these are succeeded by oval Capsules, filled with small Seeds, which, if permitted to scatter, will come up the following Spring without any Care, but when the Seeds happen to fall upon Earth, which is thrown on a hot Bed, the Plants will be forwarder and stronger than those in the open Air. This is preserved in some Gardens for Variety, but has no great Beauty.

The other Sort has been already mentioned under the Article *Herniaria*, but being ranged in this Genus by Dr. Linnaeus, I have enumerated it here.

MOLUCCELLA. *Lin. Gen. Plant.* 643. *Molucca. Tourn. Inst. R. H.* 187. *Tab.* 88. *Molucca Balm.*

The Characters are,

The Flower hath a large permanent Empalement of one Leaf, deeply indented at the Brim, where it spreads open. The Flower is of the Lip Kind, with a short Tube and Chaps. The upper Lip is erect, concave, and entire. The under Lip is trifid, the Middle Segment being longer than the other. It has 4 Stamina situated under the upper Lip 2 of which are shorter than the other, crowned by single Summits, and a Germen with 4 Parts, supporting a Style situated with the Stamina, crowned by a bifid Stigma. The Germen turns to 4 angular convex Seeds, sitting in the Empalement.

The Species are,

1. **MOLUCCELLA** *calycibus quinqueidentatis, denticulis aequalibus. Prod. Leyd.* 314. *Molucca Balm*, with Empalements indented in five equal Parts. This is the *Molucca laevis. Dod. Pempt.* 92. *Smooth Molucca Balm.*

2. **MOLUCCELLA** *calycibus septemdentatis. Prod. Leyd.* 314. *Molucca Balm*, whose Empalements are indented in seven Parts. This is the *Molucca spinosa. Dod. Pempt.* 92. *Prickly Molucca Balm.*

The 1st Sort rises with a square Stalk, 3 Feet high, spreading out into many Branches, which are smooth, and come out by Pairs; they are garnished with roundish Leaves, deeply notched on their Edges, standing on long Foot Stalks; these are placed opposite by Pairs; they are smooth, of a light green on both Sides, and at the Base of their Foot Stalks the Flowers come out in Whorls; these have very large spreading Empalements, indented in 5 Parts, and immediately under them come out 2 Bunches of pretty long Spines, one on each Side the Stalk, each Bunch consisting of 5 or 6 Spines arising from the same Point. The Flowers are small, and being situated at the Bottom of the large Empalements, are not visible at a Distance; they are white, with a Cast of purple, and shaped like those of the other Lip Flowers, having the upper Lip entire, and hollowed like a Spoon, and the under Lip is cut into 3 Segments, the Middle one being the longest. After the Flower is past, the Germen turn to four Club-shaped angular Seeds inclosed in the Empalement. It flowers in July, but unless the Season proves warm and dry, the Seeds do not ripen in England. The Smell of this Plant is to some Persons very disagreeable, and to others very pleasant.

The 2d Sort hath square smooth Stalks, of a purplish Colour, which do not rise so high as those of the former, but branch out in the same Manner. The Leaves are smaller, and stand on shorter Foot Stalks; they are deeper, and more acutely indented on their Edges. The Empalements of the Flowers are not so large, and are cut into 7 Segments, each being terminated by an acute Spine. The Flowers are like the former, as are also the Seeds; this is not so hardy as the first Sort.

The 1st grows naturally in several Parts of Syria, and the 2d is a Native of the *Molucca* Islands, from whence this Genus received its Title. They are both annual Plants, which decay soon after their Seeds are ripe, and being Natives of warm Countries, seldom perfect their Seeds in England, when they are sown in Spring; therefore the best Way is to raise the Plants in Autumn, and plant them in small Pots; these should be placed under a hot Bed Frame in Winter, where they may have free Air in mild Weather, by taking off the Glasses, but covered in frosty Weather, observing to keep them pretty dry, otherwise they are very subject to rot, when closely covered in frosty Weather. In Spring, the Plants may be turned out of the Pots, with all the Earth about their Roots, and planted in a warm Border, defended from strong Winds, giving them a little Water to settle the Earth to their Roots; after this they require no Care, but to keep them clean from Weeds, and to support them with Stakes, to prevent their being broken by Winds. The Plants thus preserved through the Winter, will flower the latter End of June, so from these good Seeds may be expected.

MOLY. See Allium.

MOMORDICA. *Tourn. Inst. Lin. Gen. Pl.* 967. Male Balsam Apple; in French, *Pomme de Merveille.*

The Characters are,

It hath male and female Flowers upon the same Plant. The male Flowers have an open concave Empalement of one Leaf. The Flower hath one large rough veined Petal, which adheres to the Empalement, and spreads open. It has 3 short Awl-shaped Stamina; in two of them the Summits are bifid, and eared on both Sides; the third has a single eared Summit; these are compressed in a Body, and have a reflexed Line containing the Parina. The female Flowers have the same Empalement and Petal, as the male, but sit upon the Germen; these have 3 short Filaments without Summits. The Germen supports one taper trifid Style, crowned by 3 oblong gibbous Stigmas. The Germen turns to an oblong Fruit, opening with an Elasticity, having 3 membranaceous Cells, filled with compressed Seeds.

The Species are,

1. **MOMORDICA** *pomis angulatis tuberculatis, foliis glabris patenti-palmatis. Hort. Cliff.* 451, Male Balsam Apple with angular warted Fruit, and smooth open-handed Leaves. This is the *Momordica vulgaris. Tourn. Inst. R. H.* 103. Common male Balsam Apple.

2. **MOMORDICA** *Zeylanica, pampinea fronde, fructu longiori. Tourn. Inst. R. H.* 103. Male Balsam Apple of Ceylon with a Vine Leaf, and a longer Fruit.

3. **MOMORDICA** *Zeylanica, pampinea fronde, fructu breviori. Tourn. Inst.* 103. Male Balsam Apple of Ceylon with a Vine Leaf, and a shorter Fruit.

4. **MOMORDICA** *pomis bispidis, cirrbis nullis. Lin. Sp. Pl.* 1010. Male Balsam Apple with prickly Fruit, and

no Tendrils to the Vines. This is the *Cucumis sylvestris aspinus diffus*. C. B. P. 314. Wild Cucumber, called Asles Cucumber, and the *Elaterium* of Boerhaave.

The 1st Sort grows naturally in *Asia*, the 2d and 3d in the Island of *Ceylon*; they are all annual Plants, which perish soon after they have ripened their Fruit; these have trailing Stalks, like those of the Cucumber and Melon, which extend 3 or 4 Feet in Length, sending out many Side Branches; they have Tendrils, by which they fasten themselves to any neighbouring Plants, to secure themselves from being tost, and blown about by the Winds, and are garnished with Leaves, shaped like those of the Vine. The Leaves of the 1st and 3d Sorts are smooth, deeply cut into several Segments, and spread open like a Hand; but those of the 2d Sort are extended more in Length, and are hairy. The Fruit of the 1st Species is oval, ending in acute Points, having several deep Angles, which have sharp Tubercles placed on their Edges; it changes to a red or purplish Colour, when ripe, opening with Elasticity, and throwing out its Seeds.

The Fruit of the 2d Sort is much longer than that of the 1st, and not so deeply channelled. The Tubercles are scattered all over the Surface, and are not sharp like those of the other; this Fruit is yellow when ripe, and casts out its Seeds with Elasticity.

The Fruit of the 3d Sort is short and pointed, like the 1st, but does not swell so large in the middle. The Angles are not deep, and the whole Surface is closely set with sharp Tubercles; this changes to a deep Orange when ripe, and casts its Seeds in like Manner.

The 4th Sort is commonly called, Wild or Spurting Cucumber, from its casting out its Seeds, together with the viscid Juice in which the Seeds are lodged, with a violent Force, if touched when ripe; and from hence it has sometimes the Appellation of *Noli me tangere*, or Touch me not. This Plant grows naturally in some of the warm Parts of *Europe*, but in *England* it is cultivated in Gardens for the Fruit which is used in Medicine, or rather the *Fæcula* of the Juice of the Fruit, which is the *Elaterium* of the Shops.

This Plant hath a large fleshy Root somewhat like that of Briony, from which come forth every Spring, several thick, rough, trailing Stalks, which divide into many Branches, and extend every Way 2 or 3 Feet; these are garnished with thick, rough, almost Heart-shaped Leaves, of a gray Colour, standing on long Foot Stalks. The Flowers come out from the Wings of the Stalk, these are male and female, growing at different Places on the same Plant, like those of the common Cucumber, but they are much less, of a pale yellow Colour, with a greenish Bottom: The male Flowers stand on short thick Foot Stalks, but the female Flowers sit on the young Fruit, which, after the Flower is faded, grows to an oval Fruit an Inch and a Half long, swelling like a Cucumber, of a gray Colour like the Leaves, and covered over with short Prickles. These do not change their Colour when ripe, like most of the other Fruit of this Class; but if attempted to be gathered, they quit the Foot Stalk, and cast out the Seeds and Juice with great Violence; so that where any Plants are growing, and the Fruit permitted to stand till it is ripe, the Seeds will

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scatter all round to a great Distance, and Plenty of Plants produced the following Spring.

But when the Fruit is designed for Use, it should always be gathered before it is ripe, otherwise the greatest Part of the Juice will be lost, which is the only valuable Part; for the Juice which is expressed, with Part of the Parenchyma of the Fruit, is not to be compared with the other for its Virtues; for the *Elaterium* which is made from the clear Juice of the Fruit, is much whiter, and will retain its Virtues much longer than that which is extracted by Pressure.

The 3 first Sorts are annual; their Seeds must be sown on a hot Bed the Beginning of *March*, and when the Plants come up, they should be transplanted out into a fresh hot Bed, as Cucumbers or Melons, putting two Plants of the same Kind under each Light, and the Plants watered and shaded until they have taken Root; after which they must be treated as Cucumbers, permitting their Branches to extend on the Ground, and observe to keep them clear from Weeds.

With this Management (provided they are not too much exposed to the Wet and open Air) they will produce Fruit in *July*, and their Seeds will ripen in *August* and *September*, when you must observe to gather it as soon as you see the Fruit open, otherwise it will be cast abroad, and with Difficulty gathered up again.

These Plants are preserved in curious Gardens for the Oddness of their Fruit; but as they take up a great deal of Room in the hot Beds, requiring frequent Attendance, and being of little Beauty or Use, so they are not much cultivated in *England*, except in Botanick Gardens for Variety.

Some put these Plants in Pots, and fasten them up to Stakes, support the Vines from trailing on the Ground, and place the Pots in Stoves; where, when they are skilfully managed, they will produce their Fruit tolerably well; in this Way they make a better Appearance, than when the Vines spread on the Ground. But when the Plants spread on the Ground, which is their natural Way of growing, they thrive much better, and produce more Fruit, than when they are supported; for though these Plants have Claspers, yet these are not formed for climbing, but merely to fasten themselves about any neighbouring Support, to secure them from being raised by the Wind and broken, which would often happen, where they grow in the open Air and are fully exposed, were it not for this Security.

The 4th Sort is easily propagated by Seeds, which (as before mentioned) if permitted to scatter, a Supply of Plants will come up the following Spring; or if the Seeds are sown upon a Bed of light Earth, the Plants will come up in about a Month after, and may be transplanted to an open Spot of Ground, in Rows at 3 or 4 Feet Distance, and almost as far asunder in the Rows; if these are carefully transplanted while young, there will be little Hazard of their growing; and after they have taken new Root, they will require no farther Care, but to keep them clear from Weeds. If the Ground is dry in which these are planted, the Roots will continue 3 or 4 Years, unless the Winter should prove very severe, which will kill them.

MONARDA. *Lin. Gen. Plant.* 34. *Leonurus*. Tourn.

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The Characters are,

The Flower has a tubulous cylindrical Empalement of one Leaf, channelled and cut into 5 equal Parts at the Brim. The Flower hath one Petal, and is of the Lip Kind; having a cylindrical Tube longer than the Empalement, divided at the Top into 2 Lips. The upper Lip is narrow, entire, and erect; the under is broad, trifid, and reflexed; the middle Segment being long and narrow, those on the Side are obtuse. It hath 2 bristly Stamina the Length of the upper Lip in which it is involved, terminated by compressed erect Summits. In the Bottom of the Tube is situated a four pointed Germen, supporting a slender Style involved with the Stamina, and crowned by an acute bifid Stigma. The Germen turns to 4 naked Seeds, inclosed in the Empalement.

The Species are,

1. MONARDA capitulis terminalibus, caule obtus-angulo. Hort. Upsal. 12. Monarda with Heads of Flowers terminating the Stalks, which have obtuse Angles. This is the *Leonurus Canadensis*, *origani folio*. Tourn. Inst. Canada Lion's Tail with an Origanum Leaf.

2. MONARDA floribus capitatis verticillatisque, caule acutangulo, foliis lanceolato-serratis glabris. Butt. Cun. 226. Monarda with Flowers collected in Heads and Whorls, an acute angular Stalk, and smooth, sawed, Spear-shaped Leaves; commonly called *Oswego Tea*.

3. MONARDA floribus verticillatis, corollis punctatis. Hort. Upsal. 12. Monarda with Flowers growing in Whorls, and spotted Petals. This is the *Clinopodium Virginianum*, *angustifolium*, *floribus amplis luteis, purpurâ maculâ notatis*. Banist. Raii Sup. Narrow leaved Field Basil of Virginia, with large yellow Flowers spotted with purple, whose Stalks have ten or twelve reddish Leaves under each Whorl of Flowers.

The 1st Sort grows naturally in Canada, and many Parts of North America. It hath a perennial Root, composed of many strong Fibres, which spread far on every Side. The Stalks rise near 3 Feet high, which are hairy, and have obtuse Angles; these send out 2 or 4 small Side Branches toward the Top; these, as also the principal Stalk, are garnished with oblong Leaves, broad at their Base, but terminate in acute Points; they are hairy, a little indented on their Edges, standing on short hairy Foot Stalks, and are placed by Pairs opposite. The Stalk and Branches are terminated by Heads of purple Flowers; these have a large Involucrum composed of 5 acute-pointed Leaves. The Flowers have each 2 Stamina which are longer than the Petal, with a Style of the same Length, crowned by a bifid Stigma. The Flowers appear in July, and are succeeded by Seeds which ripen in Autumn.

The 2d Sort grows naturally in North America, where the Inhabitants frequently use the Leaves for Tea, so it is commonly called *Oswego Tea*, by which Title it was brought to England. This hath a perennial Root and an annual Stalk, which decays every Autumn. The Stalks of this Sort are smooth, having 4 acute Angles; they rise about 2 Feet high, and are garnished with smooth, oval, Spear-shaped Leaves, indented on their Edges, and stand by Pairs opposite on very short Foot Stalks; these when bruised, emit a very grateful refreshing Odour; the Stalks send out toward their Top, 2 or 4 small Side Branches, garnished with small Leaves of the same Shape with the other. The Flowers are

produced in large Heads or Whorls at the Top of the Stalk, and there is often a smaller Whorl of Flowers, growing round the Stalk at the Joint below the Head; and out of the Head arises a naked Foot Stalk, sustaining a small Head or Whorl of Flowers; the Flowers are of a bright red Colour, they have two Lips, the upper Lip is long, narrow, and entire; the under Lip is cut into three Parts; they have each two Stamina, which are longer than the Petal, terminated by compressed Summits, and many of them have two shorter Stamina, without Summits. This Plant flowers in July, but in a moist Season, or when the Plants are in a moist Soil, they will continue in flower till the Middle or latter End of September.

Both Sorts may be propagated by parting their Roots; the first does not multiply so fast as the second; but as that produces Plenty of Seeds, it may be easily propagated that Way; If the Seeds are sown in Autumn soon after they are ripe, they Plants will come up the following Spring; but if they are not sown till Spring, the Plants seldom rise till the next Year. When the Plants come up, and are fit to remove, they should be transplanted into a shady Border at about 9 Inches Distance, and when they have taken new Root, require no other Care but to keep them clean from Weeds till Autumn, when they should be transplanted into the Borders where they are to remain. The following Summer they will flower and produce ripe Seeds, but the Roots will continue several Years, and may be parted every other Year to increase them. This loves a soft loamy Soil, and a Situation not too much exposed to the Sun.

The 2d Sort seldom ripens Seeds in England, but increases fast enough by its creeping Roots, also by Slips or Cuttings, which, if planted in a shady Border in May, will take Root, like Mint or Balm; but the Roots multiply so fast, there is seldom Occasion to use any other Method to propagate them.

This Sort loves a moist light Soil, and in a Situation where the Plants have only the Morning Sun, they will continue longer in flower, than those which are exposed to the full Sun. This is a very ornamental Plant in Gardens, and the Scent of the Leaves is very refreshing and agreeable to most People, and some are very fond of the Tea made with the young Leaves.

The 3d Sort grows naturally in North America; this is a biennial Plant, and probably in its native Country may be an annual, for the Roots perish after the Plants have perfected their Seeds. This hath square Stalks which rise about 2 Feet high, branching out from the Bottom to the Top, and are garnished with Spear-shaped Leaves, which come out in Clusters at each Joint, where there are two larger Leaves placed opposite, and several smaller come out on each Side the Stalk; the larger Leaves are about two Inches and a Half long, three Quarters broad, and are slightly indented on their Edges. Toward the upper Part of the Stalk the Flowers come out in large Whorls, having to each Whorl an Involucrum, composed of 10 or 12 small Spear-shaped Leaves, of a purplish red Colour on their Inside; the Flowers are pretty large, of the same Form with those of the other Sorts, of a dirty yellow Colour spotted with purple; these have each 2 long Stamina situated under the upper Lip, terminated by bifid compressed Sum-

Sum.

Summits, and are succeeded by 4 naked Seeds inclosed in the Empalement. It flowers in July, and if the Summer proves favourable, the Seeds ripen in Autumn.

This Plant is propagated by Seeds, which, if sown on a Border of light Earth exposed to the East, the Plants will rise very freely; when they are fit to remove, they may be transplanted into a shady Border as hath been directed for the first Sort; and if they shoot up Stalks to flower, they should be cut down to strengthen the Roots, that they may put out lateral Buds, for when they are permitted to flower the first Year, the Roots seldom live through the Winter, therefore they should be prevented; In Autumn the Plants may be removed, and planted in the Borders of the Pleasure Garden, where they will flower the following Summer; and if the Season should prove dry, they should be duly watered, otherwise they will not be near so beautiful, nor will the Plants produce good Seeds.

MONBIN. See Spondias.

MONTIA. See Heliocarpus.

MOREA.

The Characters are,

The Flowers are included in an oblong acute-pointed Spatha, or Sheath, which is permanent, and opens in two Parts. The Flower has 6 Spear-shaped Petals which spread open plain, and are connected at their Base; 3 of these are alternately larger than the other; it has also 3 erect bifid Petals, which encompass the Stamina, and Style; it has 3 very short Stamina, terminated by oblong erect Summits and an oval Germen situated under the Flower, supporting a short Style, crowned by 3 bifid Stigmas. The Germen afterward turns to an oval Capsule with 3 longitudinal Furrows, divided into 3 Cells, which open with 3 Valves and are filled with roundish Seeds.

I have taken the Liberty of constituting this Genus of Plants, as their Flowers differ in Form from the *Ixia* and *Iris*, to both which Genera they have great Affinity, and have given it the Title of *Morea*, in Respect to the ingenious and learned Robert More, Esq; of *Sbrewsbury*, who is an excellent Botanist, and has a Garden well stored with Plants.

1. MOREA *spatba biflora*, caule planifolio, floribus minoribus. Icon. Plant. Tab. 238. *Morea* with two Flowers in each Sheath, plain Leaves on the Stalks, and smaller Flowers.

2. MOREA *spatba uniflora*, caule planifolio, floribus majoribus. Ibid. *Morea* with one Flower in a Sheath, plain Leaves on the Stalk and larger Flowers.

3. MOREA *spatba uniflora*, foliis gladiolatis, radice fibrosa. Icon. Tab. 239. *Morea* with one Flower in a Sheath, Sword-shaped Leaves and a fibrous Root.

These Plants grow naturally at the *Cape of Good Hope*, from whence I received their Seeds, which succeeded in the *Chelsea Garden*, and in the Spring of 1758, they produced their beautiful Flowers.

The 1st Sort has a bulbous Root, shaped like the *Saffron* and annually renewed as that is. The Root which was planted always decaying after it has produced Flowers, and a new Root formed over the old one for the succeeding Year. The Stalk rises about a Foot high; it is taper, of a purplish Colour at Bottom, and garnished with narrow plain Leaves whose Bases embrace the Stalks; they are more than a Foot long, and half an Inch

broad at their Base, ending in acute Points; they are flaccid, and of a deep green Colour. The Flowers are produced at the Top of the Stalks; there are 2 Flowers inclosed in each Spatha or Sheath. The Foot Stalks which sustain them are longer than the Sheath; under each Flower is situated the Germen, upon which the Flower sits close; it is composed of 6 Petals whose Tails are connected at Bottom; these are Spear-shaped, spreading open flat, 3 being alternately larger than the other; they are of a fading blue Colour, having each a Spatula shaped Spot toward the Bottom. In the Center of these come out 3 small erect Petals, bifid at their Points; these inclose 3 short Stamina and the Style. The Flowers appear in May, and the Seeds ripen in June.

The 2d Sort has Roots, Stalks, and Leaves like the first, but there is only one Flower in each Sheath, which is larger than those, and the Petals are of a faded purple Colour, each having a large yellow Spot toward their Tail. It flowers and perfects its Seeds about the same Time as the former.

The 3d Sort came by the Dutch Title of *White Water Lily*. The Root is composed of several fleshy Fibres; the Leaves are flat and shaped like those of the *Iris*, and are of a dark green Colour; they are 6 or 7 Inches long, and half an Inch broad at their Base, ending in acute Points. The Stalk rises more than a Foot high, garnished at each Joint with one small Leaf shaped like those below, whose Base embraces the Stalk which is terminated by one Flower, arising out of a smooth sharp-pointed Sheath: it is composed of 6 oval Spear-shaped Petals, of a dirty white shaded with a Sky blue Colour; these are equal in Size, and spread open flat. In the Center of these arise 3 forked Petals standing erect, of a blueish purple; these encompass the Stamina and Style, the Stamina being connected at their Base to their Tails. The outer Petals have a large Sulphur-coloured Spot in each. This Sort flowers in June, and then the Germen swells to a large, oblong, furrowed Capsule with 3 Cells, filled with roundish compressed Seeds, which do not ripen till Winter. The Leaves of this remain green all the Year.

These Plants may be propagated by Seeds, which should be sown in Pots filled with light Earth; those of the 2 first should be sown in August, and those of the 3d soon after they are ripe. The Pots should be placed in a hot Bed Frame in Winter to screen the Seeds from Frost. In Spring the Plants will appear, when the Glasses should be drawn off every Day when the Weather is mild, to prevent the Plants being drawn up weak, and in May the Pots should be placed abroad in a sheltered Situation, where they may enjoy the Morning Sun, but screened from the South Sun. If the Season proves dry, the Plants must be frequently refreshed with Water but it must not be given them in too great Plenty. Toward the latter End of June the Leaves of the two first Sorts will decay, after which, if the Roots are too close, they may be transplanted; but as they will be very small, 6 or 7 of them may be planted in one small Pot, and then placed on an East Border, where they may have only the Morning Sun, and be kept clean from Weeds till Autumn, when they must be placed in the Frame to be screened from Frost, but should be always exposed to the open Air in mild Weather; this should be repeated

ted every Winter, and in 3 Years the Plants will flower. The Time for removing these Bulbs is always soon after their Stalks and Leaves decay. In Summer when they are at Rest, they must have very little Water, and only require to be kept clean from Weeds, and in Winter they must be sheltered in a Frame.

These may also be propagated by Offsets produced from the old Roots, which will flower the 2d Year.

The 3d Sort may be treated the same Way, but as the Leaves of this continue all the Year, the best Time to transplant them is in September, when the Roots are most inactive. This may be propagated by parting the Roots, as practised for the Flag-leaved Iris.

MORINA. Tourn. Cor. 48. Tab. 480. Lin. Gen. Plant. 39. Diotheca. Vaill. Mem. Acad. 1722.

The Characters are,

It hath a double Empalement; that of the Fruit is tubulous, of one Leaf, indented at the Brim and permanent; that of the Flower is tubulous, bifid, of one Leaf, and permanent. The Flower hath one Petal with a long Tube enlarged upward and a little incurved. The Top is divided into two Lips; the upper Lip is small and bifid, the under is cut into 3 equal obtuse Segments, the middle one being extended beyond the other. It hath 2 bristly Stamina situated near the Style, terminated by Heart-shaped erect Summits. The globular Germen is situated under the Flower, supporting a slender Style which is longer than the Stamina, crowned by a Target-shaped Stigma; the Germen becomes a single Seed, crowned by the Empalement of the Flower.

There is but one Species of this Genus at present known, which is,

MORINA Orientalis, carlinæ folio. Tourn. Cor. East-ern Morina, with a Carline Thistle Leaf.

This Plant was discovered by Dr. Tournefort, in his Travels in the Levant, who gave it this Name in Honour of Dr. Morin, a Physician at Paris.

It grows naturally near Erzeron in Persia, and was in the English Gardens before the severe Winter in 1740, which killed all the Plants. The Root of this Plant is taper and thick, running deep into the Ground sending out several thick strong Fibres as large as a Finger; the Stalk rises near 3 Feet high; it is smooth, of a purplish Colour toward the Bottom, but hairy and green at the Top, garnished at each Joint by three or four prickly Leaves like those of the Carline Thistle; they are 4 or 5 Inches long, and an Inch and a Half broad, of a lucid green on their upper Side, but of a pale green on their under Side, and a little hairy, armed on their Edges with Spines. The Flowers come out from the Wings of the Leaves on each Side the Stalk; these have very long Tubes, slender at the Bottom, but enlarged upward and a little incurved; the Brim spreads open with two large Lips, the upper Lip is indented at the Top and rounded; the lower Lip is cut into 3 obtuse Segments; under the upper Lip are situated two bristly Stamina, which are crooked, and crowned with yellow Summits. These Flowers appear in July, but I never had any Seeds succeed them. Some of the Flowers are white, and others of a purplish red on the same Plant.

This Plant is propagated by Seed, which should be sown soon after it is ripe in Autumn, otherwise the Plants will not come up the following Summer; for I have several Times observed, where the Seeds have been sown in

Spring, they have remained in the Ground 14 or 15 Months before the Plants have appeared. These Seeds should be sown in the Places where the Plants are to remain, because they send forth Tap Roots, which run very deep into the Ground; and when these are broken or injured in transplanting, the Plants seldom thrive after. They may be sown in open Beds or Borders of fresh light Earth, being careful to mark the Places, that the Ground may not be disturbed; The Ground where the Seeds are sown must be kept clear from Weeds, which is all that is necessary to be done until the Plants come up; where they are too close together, they should be thinned so as to leave them near 18 Inches apart; after which Time they will require no other Culture but to keep them constantly clear from Weeds; and in the Spring, just before the Plants put out new Leaves, to stir the Ground gently between them, and lay a little fresh Earth over the Surface of the Bed to encourage them.

In Autumn these Plants decay to the Ground, and send forth new Leaves the following Spring; but it will be three Years from the Time of the Plants first coming up to their flowering, though after that Time they will flower every Season; and the Roots will continue many Years if not disturbed, or killed by very severe Frost.

MORUS. Tourn. Inst. Lin. Gen. Plant. 936. [of *μαύρος*, black, because its Fruit is ordinarily so.] The Mulberry Tree; in French, *Meurier*.

The Characters are,

It hath male Flowers growing at separate Distances from the female, on the same Tree. The male Flowers are collected in long taper Ropes or Katkins; these have no Petals, but have 4 Awl-shaped erect Stamina, longer than the Empalement, terminated by single Summits. The female Flowers are collected into roundish Heads; these have no Petals, but a Heart-shaped Germen, supporting 2 long rough reflexed Styles, crowned by single Stigmas. The Empalement of these becomes large, fleshy, succulent Fruit, composed of several Protuberances, in each of which is one oval Seed.

The Species are,

1. MORUS foliis cordatis scabris. Hort. Cliff. 441. Mulberry with rough Heart-shaped Leaves. This is the *Morus fructu nigro*. C. B. P. 459. Mulberry with a black Fruit, or the common Mulberry.

2. MORUS foliis palmatis hirsutis. Mulberry with Hand-shaped hairy Leaves. This is the *Morus fructu nigro minori*, foliis eleganter laciniatis. Tourn. Inst. R. Smaller black Mulberry with elegant cut Leaves.

3. MORUS foliis cordatis subtus villosis, amentis cylindricis. Lin. Sp. Pl. 986. Mulberry with Heart-shaped Leaves hairy on their under Side, and cylindrical Katkins. *Morus Virginienensis arbor, loti arboris instar ramosa, foliis amplissimis*. Pluk. Phyt. Virginia Mulberry branching like the Nettle Tree, and having very large Leaves.

4. MORUS foliis oblique cordatis levibus. Hort. Cliff. 441. Mulberry with oblique, smooth, Heart-shaped Leaves. This is the *Morus fructu albo*. C. B. P. 459. Mulberry with a white Fruit.

5. MORUS fructu viridi, ligno sulphureo tinctorio. Sloan. Hist. Jam. 2. p. 3. Mulberry with a green Fruit, whose Wood dyes a Sulphur Colour, or Fustick Wood.

6. MORUS foliis palmatis, fructibus bispidis. Lin. Sp. Plant. 986. Mulberry with Hand-shaped Leaves and prickly Fruit. This is the *Morus sativa, foliis urticae mortuae*,

mortuae, cortice papyrifera. Kemp. Amœn. 471. Cultivated Mulberry with Leaves like Dead Nettle, and of whose Bark Paper is made.

7. *MORUS foliis ovato-oblongis utrinque æqualibus, inæqualiter serratis. Flor. Zeyl. 337.* Mulberry with oval oblong Leaves, which are equal on both Sides, but unequally sawed. This is the *Tinda-parua*. *Hort. Mal. 1. p. 87. fol. 49.*

8. *MORUS foliis ovato-oblongis acuminatis obliquis, ramis aculeatis.* Mulberry with oval, oblong, acute-pointed Leaves, which are oblique to the Foot Stalk, and prickly Branches. This is the *Zanthoxylum aculeatum, carpinifolius, Americanum, cortice cinereo. Pluk. Phyt. 239. fol. 3.* Prickly *Zanthoxylum* of *America*, with Hornbeam Leaves and an Ash-coloured Bark.

The 1st Sort is the common black Mulberry Tree, which is cultivated for the Delicacy of its Fruit. This grows naturally in *Persia*, from whence it was first brought to the southern Parts of *Europe*, but is now become common in every Part of *Europe*, where the Winters are not very severe; in the northern Parts of *Sweden* these Trees will not live in the open Air; and in several Parts of *Germany* they are planted against Walls, and treated as the Peach, and other tender Fruits are here.

These Trees are generally of both Sexes, having male Flowers or Katkins, on the same Tree with the Fruit; but it often happens, that some of the Trees which are raised from Seeds, have only male Flowers, and produce no Fruit; so that those who plant these Trees for their Fruit, should never make Choice of such as have been propagated by Seeds, unless they have seen them produce Fruit in the Nursery. It is also the surest Way to mark such Trees as are fruitful in the Nursery, at the Time when their Fruit is upon them, because those Trees which are propagated by Layers, are sometimes of the male Sort; I have several Times observed, that some of the large Branches of these Trees have produced only Katkins, when the other Parts of the Trees have been very fruitful; so that unless Care is taken in the Choice of the Branches for making the Layers, there is the same Hazard as in seedling Trees: Nor should the Shoots which come out near the Roots of old Trees be ever laid down, for these rarely produce Fruit until they have been planted many Years, although the Trees from which these were produced might be very fruitful. I have observed some Trees which produced only Katkins for many Years after they were planted, and afterward have become fruitful; the same I have observed in Walnut Trees, and my honoured Friend the Chevalier *Ratzeburg*, has informed me, that he has observed the same in the *Lentisk* and *Turpentine* Trees.

The old Mulberry Trees are not only more fruitful than the young, but their Fruit are much larger and better flavoured; so it is the best Way to propagate from them, and to make Choice of those Branches which are most fruitful. The usual Method of propagating these Trees, is by laying down their Branches, which will take Root in one Year, and are then separated from the old Trees; but as the most fruitful Branches are often so far from the Ground as not to be layed, unless by raising Boxes or Baskets of Earth on Supports for this Purpose, so the better Way is to propagate them by Cuttings, which,

if rightly chosen and skilfully managed, will take Root very well; and in this Method there will be no Difficulty in having them from Trees at a Distance, and from the most fruitful Branches. These Cuttings should be the Shoots of the former Year, with one Joint of the two Years Wood to their Bottom; the Cuttings should not be shortened, but planted their full Length, leaving two or three Buds above Ground. The best season for planting them is in *March*, after the Danger of hard Frost is over; they should be planted in light rich Earth, pressing the Ground pretty close about them; and if they are covered with Glasses, it will forward their putting out Roots; but where there is not such Convenience, the Ground about them should be covered with Moss, to prevent its drying; if this is carefully done, the Cuttings will require but little Water, and succeed much better than with having much Wet. If the Cuttings succeed well and make good Shoots, they may be transplanted the following Spring into a Nursery, where they should be regularly trained to Stems, by fixing down Stakes by each, to which the principal Shoots should be fastened; and most of the lateral Branches should be closely pruned off, leaving only 2 or 3 of the weakest to detain the Sap, for the Augmentation of the Stem for when they are quite divested of their Side Shoots, the Sap mounts to the Top, so that the Heads of the Trees grow too fast for the Stems, and become too weighty for their Support. In about 4 Years Growth in the Nursery, they will be fit to transplant where they are to remain; for these Trees are transplanted with greater safety while young, than when they are of a large Size.

If the Cuttings are planted in a Bed fully exposed to the Sun, it will be proper to arch the Bed over with Hoops, that they may be shaded with Mats in the Heat of the Day during the Spring, till they have put out Roots; after which, the more they are exposed to the Sun the better they will succeed, provided the Ground is covered with Moss or Mulch to prevent its drying; for the Sun will harden the Shoots, and thereby they will be in less Danger of suffering by the early Frosts in Autumn; for when these are in a shady Situation they are apt to grow vigorously in Summer, so will be replete with Moisture, and the early Frosts in *October* frequently kill their Tops; and if the following Winter proves severe, they are often killed to their Roots, and sometimes entirely destroyed. I have two or three Times made Trial of planting the Cuttings of Mulberries on a hot Bed, and have found them succeed extremely well. This I was led to, by observing some Sticks of Mulberry Trees which were cut for Forks, and thrust into the hot Bed, to fasten down the Vines of Cucumbers; which, although they had been cut from the Tree a considerable Time, yet many of them put out Roots and shot out Branches; so that where any Person is in Haste to propagate these Trees, if the Cuttings are planted on a hot Bed, they will take Root much sooner than in the common Ground.

This Tree delights in rich light Earth, such as is in most of the old Kitchen Gardens about *London*, where there is also a great Depth of Earth; in some of those Gardens there are Trees of a very great Age, which are very healthy and fruitful, and their Fruit is larger and better flavoured, than those of the younger Trees. I have never

never yet seen any of these Trees which were planted in a very stiff Soil, or on shallow Ground either upon Clay, Chalk, or Gravel, which have been healthy or fruitful, but their Stems and Branches are covered with Moss, so that the little Fruit which they sometimes produce are small, ill tasted, and late before they ripen.

If these Trees are planted in a Situation defended from the strong South and North-west Winds, it will preserve their Fruit from being blown off; but this Shelter whether it be Trees or Buildings, should be at such a Distance, as not to keep off the Sun; for where the Fruit has not the Benefit of his Rays to dissipate the Morning Dews early, they will turn mouldy and rot upon the Trees. There is never any Occasion for pruning these Trees, more than to cut off any Branches which may cross others, so as to rub and wound their Bark, by their Motion occasioned by Wind; for their Shoots should never be shortened, because the Fruit is produced on the young Wood.

The 2d Sort grows naturally in *Sicily*, from whence I received the Seeds, and raised a good Number of the Plants; all of these were totally different in their Leaves from the common Mulberry, so I am certain of its being a distinct Species. It is also a Tree of humbler Growth, but the Fruit is small and has no Flavour, so is not worth propagating; some of the Trees produced Fruit two or three Years in the *Chelsea Garden*.

The white Mulberry is cultivated for its Leaves to feed Silk Worms, in *France, Italy, &c.* but the *Perfians* always make Use of the black Mulberry for that Purpose; and I have been assured by a Gentleman of Honour, who has made Trial of both Sorts of Leaves, that the Worms fed with those of the black Sort produce much better Silk than those fed with the white; he also observes, that the Leaves of the black Sort should never be given to the Worms, after they have eaten for some Time of the white, lest the Worms should burst, which is often the Case when they are thus treated.

The Trees designed to feed Silk Worms, should never be suffered to grow tall, but rather kept in a Sort of Hedge; and instead of pulling off the Leaves singly, they should be sheared off with the young Branches; which is sooner done, and not so injurious to the Tree.

This white Sort may be propagated either from Seeds or Layers, as the black Mulberry, and is equally hardy; but the most expeditious Method of raising these Trees in Quantity, is from the Seeds, which may be procured in Plenty from the South of *France* or *Italy*; the best Way to sow these Seeds in *England*, is to make a moderate hot Bed, which should be arched over with Hoops, and covered with Mats; upon this Bed the Seeds should be sown in the Middle of *March*, and covered over with light Earth about a Quarter of an Inch deep: In very dry Weather the Bed must be frequently watered, and in the Heat of the Day shaded with Mats, and also covered in the Nights when they are cold; with this Management the Plants will come up in five or six Weeks, and being tender when they first appear, must be guarded against frosty Mornings, which often happen in *May*, and destroy such tender Plants; during the Summer they must be kept clean from Weeds, which is all the Culture they require: But there must be Care taken of them

the first Winter, especially to cover them in Autumn, when the first Frosts come, which will kill the tender Plants to the Ground, if they are not protected; the following *March* these Plants should be transplanted into the Nursery to get Strength, where they may remain two or three Years, and then should be removed where they are to continue.

There are two or three Varieties of this Tree, which differ in the Shape of their Leaves, Size, and Colour of their Fruit; but as they are of no other Use than for their Leaves, the strongest shooting and the largest Leaf Sort should be preferred.

The 3d Sort, which is the large leaved *Virginian* Mulberry with black Shoots, is more uncommon than either of the former; there is a large Plant of this growing in the Gardens of the Bishop of *London* at *Fulham*, which has been there several Years, but has never produced any Fruit that I could learn; it hath some Years a great Number of Katkins, like those of the Hazel Nut, which occasioned Mr. *Ray* to give it the Name of *Corylus*; but it may be one of the male Trees which do not produce Fruit, as sometimes happens in the common Sorts; the Leaves of this are somewhat like those of the common Mulberry Tree, but rougher.

This Tree has not been propagated yet in this Country, for though it has been budded and grafted upon both the black and white Mulberries, yet I cannot hear, that it hath succeeded upon either; and the Tree being tall, cannot be laid down, which is the most likely Method to propagate it. This is very hardy, and will endure the Cold of our Climate in the open Air very well, and is coveted as a Curiosity by such as delight in Variety of Trees and Shrubs.

The 5th Sort is the Tree whose Wood is used by Dyers, and better known by the Title of Fustick, which is given to the Wood, than by its Fruit, which is of no Estimation. This grows naturally in the *West-India* Islands, but in greater Plenty at *Campeachy*, where it abounds in all the Woods. This Wood is one of the Commodities exported from *Jamaica*, where it grows in greater Plenty than in any other of the *British* Islands.

This Tree in the Countries where it grows naturally, rises to the Height of sixty Feet and upward; it has a light brown Bark which hath some shallow Furrows; the Wood is firm, solid, and of a bright yellow Colour.

It sends out many Branches on every Side, covered with a white Bark, and are garnished with Leaves about 4 Inches long, which are broad at their Base, indented at the Foot Stalk, where they are rounded, but one Side is broader than the other, so that they are oblique to the Foot Stalk: these diminish gradually, and end in acute Points; they are rough like those of the common Mulberry, of a dark green, and stand on short Foot Stalks. Toward the End of the young Branches, come out short Katkins of a pale herbaceous Colour, and in other Parts of the same Branches the Fruit is produced, growing upon short Foot Stalks; they are as large as Nutmegs of a roundish Form, full of Protuberances like the common Mulberry, green within and without of a luscious sweet Taste when ripe.

It is too tender to thrive in this Country, unless preserved in a warm Stove. There are several of the Plants now growing in the *Chelsea Garden*, which were raised

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raised from Seeds sent from *Jamaica*. The Seeds come up very freely on a hot Bed, and when the Plants are fit to remove, they should be each planted in a separate small Pot filled with fresh light Earth, and plunged into a hot Bed of Tanners Bark, and shaded from the Sun till they have taken new Root; then they should be treated as other Plants from hot Countries, always keeping them in the Tan Bed in the Stove, where they will make good Progress. These Plants retain their Leaves all the Year in the Stove.

The 6th Sort grows naturally in *China* and *Japan*, where the Inhabitants make Paper of the Bark; they cultivate the Trees for that Purpose on the Hills and Mountains, much after the same Manner as Osiers are cultivated here, cutting down the young Shoots in Autumn for their Bark. There were several of these Trees raised from Seeds a few Years past, in the Gardens of the Right Hon. the Earl of *Northumberland*, who was so good as to favour me with one of the Plants, which thrives very well in the open Air, without any Shelter, as many of the Trees and Plants of those Countries will do, if they grow there on Mountains. This Plant makes strong vigorous Shoots, but seems not to be of tall Growth, for it sends out many lateral Branches from the Root, upward. The Leaves are large, some of them entire, others deeply cut into three, and some into five Lobes, in Form of a Hand; they are of a dark green, and rough to the Touch, but of a pale green, and somewhat hairy on the under Side, falling off on the first Approach of Frost in Autumn, as do those of the common Mulberry. The Description which *Kempfer* gives of the Fruit is, that they are a little larger than Peas, surrounded with long purple Hairs, are composed of *Acini* or Protuberances, and when ripe, change to a black purple, and are full of sweet Juice.

This Tree may be propagated by laying the Branches, or it may be multiplied by planting the Cuttings, as before directed for the common Mulberry.

The 7th Sort grows naturally in *India*, where it becomes a large Tree. It hath a soft, thick, yellowish Bark, with a milky Juice like the Fig Tree, which is astringent. The Branches come out on every Side, garnished with oblong oval Leaves, standing on short Foot Stalks; both Sides of these Leaves are equal, but their Edges unequally sawed; they are rough, of a dark green on their upper Side, but pale on their under, standing alternately on the Branches. The Flowers come out in round Heads at the Foot Stalks of the Leaves, on each Side the Branches; they are of an herbaceous white Colour; the male Flowers have 4 Stamina; the female are succeeded by roundish Fruit, which are first green, afterwards white, and when ripe turn to a dark red.

I received the Seeds of this Plant from *Bombay*, which succeeded in the *Chelsea* Garden. The Plants are too tender to live out of a Stove in this Country, for as I raised a good Number of the Plants, so when they had obtained Strength, I placed some of them in different Situations, where they were defended from the Frost, but not one survived the Winter; those however which were kept constantly in the Bark Stove, and treated as other tender Plants, giving them but little Water in Winter, thrived well and retained their Leaves all the Year.

M U L

The 8th Sort grows naturally in *Jamaica* and the *Bahama* Islands, from which Places I received the Seeds. The Wood is cut and sold for the same Uses as the 5th, from which this Tree has not been well distinguished by Botanists; this does not grow to so great Size as the 5th; the Branches are slenderer, the Leaves narrower, and are rounded at their Base, sawed on their Edges, and end in acute Points. At the Foot Stalk of each Leaf, comes out two sharp Thorns, which, in the older Branches grow two Inches Long. The Fruit is shaped like that of the fifth Sort, but smaller.

MOSCHATELLINA. See *Adoxa*.

MOSS. See *Muscus*.

MOTHERWORT. See *Cardiaca*.

MOULD, the Goodness of which may be known by the Sight, Smell, and Touch.

First, by the Sight: Those Moulds that are of a bright Chestnut, or hazelly Colour, are counted the best; of this Colour are the best Loams, and also the best natural Earth, and this will be the better yet, if it cuts like Butter, and does not stick obstinately, but is short, tolerably light, breaking into small Clods, is sweet, will be tempered without crusting, or chaping, in dry Weather, or turning to Mortar in wet.

The next to that, the dark gray and russet Moulds are accounted the best, the light and dark Ash Colour are reckoned the worst, such as are usually found on common, or heathy Ground; the clear tawny is by no Means to be approved, but that of a yellowish red Colour is accounted the worst of all; this is commonly found in wild and waste Parts of the Country, and, for the most Part, produce nothing but Furz and Fern, according as their Bottoms are more or less of a light and sandy, or of a spewy Gravel, or clayey Nature.

Secondly, by the Smell; all Lands that are good and wholesome, will, after Rain, or breaking up by the Spade, emit a good Smell.

Thirdly, by the Touch: By this Means we may discover whether it consists of Substances entirely arenaceous, or clammy; or, according as it is expressed by Mr. *Borllyn*, whether it be tender, fatty, deterfive, or slippery, or more harsh, gritty, porous, or friable.

That being always the best that is between the two Extremes, and does not contain the two different Qualities of soft and hard mixed, of moist and dry, of churlish and mild, that is, neither too unctuous or too lean, but such as will easily dissolve, of a just Consistence, between Sand and Clay, and such as will not stick to the Spade or Fingers upon every Flash of Rain.

A Loam, or Brick Mould, is not to be disapproved, as requiring little Help or Improvement but the Spade, and is esteemed both by the Gardener and Florist.

MUCILAGE is a viscous clammy Substance about Seeds, &c.

MUCILAGINOUS signifies, endowed with a clammy viscous Matter.

MULBERRY. See *Morus*.

MULLEIN. See *Verbascum*.

MULTISILIQUOUS Plants are such as have after each Flower, many distinct, long slender, and, many Times, crooked Cases, or *Siliques*, in which their Seed is contained, and which, when they ripen, open of themselves, and let the Seeds drop. Of this Kind is the

Bear's

Bear's Foot, Columbines, common Houseleek, Navelwort, Orpine, &c.

MUMMY, a Sort of Grafting Wax, made of one Pound of common black Pitch, and a Quarter of a Pound of common Turpentine, put into an earthen Pot, and set on the Fire in the open Air; in doing this you ought to hold a Cover in your Hand, in order to quench it, by putting it thereon, which is to be done several Times, letting it on the Fire again, that the nitrous and volatile Parts may be evaporated. The Way to know when it is enough, is by pouring a little of it upon a Pewter Plate, and if it be so, it will coagulate presently; then this melted Pitch is to be poured into another Pot, and a little common Wax added to it, mixing them well together, and then to be kept for Use.

Agricola directs using this Mummy as follows:

When you would dress Roots with this Wax, you must melt it, and afterwards let it cool a little; then dip in the Ends of the Pieces of the Roots you would plant (for he proposes it for the planting Pieces of Roots of Trees, &c.) one after the other, but not too deep, and afterwards to put them in Water, and to plant them in the Earth, the small End downwards, so that the larger End may appear a little Way out thereof, and have the Benefit of the Air, and then to press the Earth very hard down about them, that they may not receive too much Wét, because that would rot them.

Mummy for exotick Plants; by the same Author.

Take half a Pound of Gum Copal, beat it very fine, and searfe it: Take three Pounds of *Veneri* Turpentine, and melt it over a slow Fire in a strong earthen Pot; when the Turpentine is melted and liquidated, put the sifted Gum into it, keep it continually stirring with a little Stick, augmenting the Fire gradually, and it will all dissolve insensibly; afterward let the Turpentine evaporate well, and it will thicken; when it is become of a sufficient Consistence, make it up into little Rolls, like Sealing Wax, and keep it for Use.

This Mummy, he says, is an excellent Vulnerary for Plants, being subject to no Corruption, as other gummy Things are; it hinders any Rottenness between the Stock and the Root, by means of which the *Callus* is formed the sooner, and spreads over all the Parts, and the Stock becomes entirely connected with the Root. It also gives Strength and Vigour to the Root.

Vegetable Mummy; by the same Author.

Fill a Kettle, or earthen Pot, about a third Part full of common black Pitch, add to it a little fine Resin, or sulphurated Pitch, and a little yellow Wax; melt these together till they become liquid, then take them off the Fire, and let them stand till they have done smoaking; when cool, plaster the Incisions which are made for Inoculation, Grafting, &c. with a Brush.

Garden or Forest Mummy; by the same Author.

Take three Pounds of common Turpentine, and four Pounds of common Pitch; melt the Turpentine over the Fire, and, having beaten the Pitch to a Powder, throw it in; when they are well mixed together, and grown pretty thick, take it off, and keep it for Use.

This Composition may be either made up into little Sticks like Sealing Wax, to be used on little Trees, or it may be kept in little Pots, and melted over a slow Fire,

when there is Occasion to use it, and dipping a little Brush in it, you may plaster the Graft.

Noble Mummy, or Grafting Wax; by the same.

Take two Pounds of pure Pitch, such as is called at *Ratisbon* Virgin Pitch, add to it half a Pound of good Turpentine; put them together in an earthen Pot, and set them over the Fire, that the volatile Part of the Turpentine may evaporate, otherwise it would be very prejudicial to Trees and Roots. Prove it as the former, to know when it is enough; then add half a Pound of Virgin Wax, and half an Ounce of pounded Myrrh and Aloes; when these are well mixed, make it up into little Rolls, or keep it in Gallipots.

The Time he directs for performing the Operation on the Roots, is in the Months of *September*, *October* and *November*; though it may succeed well at any Time of the Year, yet those Months are the most proper. The only Difference he says, is what is planted in Spring, will shoot out in *June* or *July*, and what is planted in Autumn, not till the next *April*.

The aforesaid Author mentions great Performances by using these Mummies; those who have a Mind to be satisfied, may peruse his Treatise.

MUNTINGIA. *Plum. Gen. Nov. 41. Tab. 6. Lin. Gen. Plant. 575.*

The Characters are,

The Empalement of the Flower is cut into five Segments to the Bottom. The Flower hath five Heart-shaped Petals, narrow at their Base, which are inserted in the Empalement, and spread open like a Rose. It has a great Number of Stamina, terminated by roundish Summits. In the Center is situated a roundish Germen, having no Style, but is crowned by a Stigma divided into many Parts. The Germen turns to a soft Fruit, with one Cell crowned by the Stigma, like a Navel, and filled with small Seeds.

The Species are,

1. **MUNTINGIA** foliis cordato-lanceolatis acuminatis subtus tomentosis, pedunculis unifloris. *Muntingia* with Heart-Spear-shaped Leaves, ending in acute Points, woolly on their under Side, and Foot Stalks with one Flower. *Muntingia folio ferriceo molli, fructu majori. Plum. Muntingia* with a soft silky Leaf, and a larger Fruit.

2. **MUNTINGIA** foliis lanceolatis scabris trinerviis, floribus confertis axillaribus sessilibus. *Muntingia* with rough Spear-shaped Leaves, having three Veins, and Flowers growing in Clusters from the Wings of the Stalk, and sitting close. *Muntingia folio ulmi aspero, fructu minimo glomerato. Plum. Muntingia* with a rough Elm Leaf, and a very small Fruit growing in Clusters.

3. **MUNTINGIA** foliis oblongo-ovatis acutis rugosis, floribus alaribus confertis pedunculatis. *Muntingia* with oblong oval, acute, rough Leaves, and Flowers growing in Clusters upon Foot Stalks, at the Wings of the Stalk. This is the *Muntingia folio cori, fructu minore. Plum. Nov. Gen. Muntingia* with a Cornel Leaf, and a lesser Fruit.

The Title of this Genus was given to it by Father *Plumier*, in Honour of Dr. *Muntingius*, Professor of Botany at *Groningen*, who published a Folio in Botany, entitled, *Phytographia Curiosa*; in which there are many Figures of Plants engraven on Copper Plates; he also published two Books of Plants in Quarto, one of which

is entitled, *Aloedarum*, in which the Figures of several Sorts of Aloes are exhibited; the Title of the other is, *De Herba Britannica Antiquorum*.

The 1st Sort is figured and described by Sir Hans Sloane, in his History of *Jamaica*, by the Title of *Loti arboris folio angustiore, rubi flore, fructu polyspermo umbilicato*. 2. p. 80. This Tree rises thirty Feet or more, in its native Soil, sending out many Branches toward the Top, covered with a smooth dark purple Bark, garnished with Leaves, about 3 Inches long, and 3 Quarters broad at their Base, where they are rounded Heart-fashion at the Foot Stalk; these end in acute Points, are very woolly on their under Side, but smooth above, and of a lucid green; they are slightly sawed on their Edges, and placed alternately. The Flowers come out from the Wings of the Stalk, standing on long Foot Stalks; they are composed of 5 Heart-shaped Petals, which are white, and spread open, like those of the Bramble, having many Stamina, about half the Length of the Petals, terminated by globular Summits, and in the Center is situated a roundish Germen, crowned by a many pointed Stigma. The Germen turns to a pulpy umbilicated Fruit, as large as the Fruit of the Cockspur Hawthorn, and, when ripe, of a dark purple Colour, inclosing many small, hard, angular Seeds; this Sort has produced Flowers and Fruit in England.

The 2d Sort grows naturally in *Jamaica*; this seldom rises more than 12 or 14 Feet, sending out many Branches the whole Length, which are covered with a dark brown Bark, garnished with Spear-shaped Leaves, about two Inches long, and half an Inch broad; they are very rough, and their Borders are reflexed, standing alternately pretty close together, on very short Foot Stalks. The Flowers come out at every Leaf in Clusters, sitting very close to the Stalks; they are small, white, shaped like those of the first, and are succeeded by small umbilicated Fruit, yellowish when ripe.

The 3d Sort grows in the *West-Indies*, where it rises from 12 to 15 Feet, sending out many hairy Branches, covered with a light brown Bark, and garnished with oval Leaves, an Inch and a Half long, and an Inch broad in the Middle, ending in a Point; they are rough, and a little hairy; they have six Veins, which come from the Mid-rib, two arising near the Base, two more a little higher, and the other two near the Point: these diverge toward the Borders of the Leaf, but meet again at the Point; they are of a yellowish green. The Flowers come out in small Clusters from the Side of the Branches, standing on short Foot Stalks; they are small, yellowish, shaped like the other Sorts, and are succeeded by small Orange-coloured Fruit.

The Seeds of these three Sorts were sent from *Jamaica*, and succeeded in some *English* Gardens.

These Plants are propagated by Seeds, sown in Pots filled with light rich Earth, and plunged into a moderate hot Bed of Tanners Bark, and in warm Weather the Glasses should be raised to admit fresh Air. These Seeds will often remain in the Ground a Year before the Plants will appear, in which Case the Pots must be kept constantly clear from Weeds, and should remain in the hot Bed till after *Michaelmas*, when they may be removed into the Stove, and plunged into the Bark Bed, between other Pots of tall Plants, where they may remain.

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During the Winter Season, these Pots should be now and then watered, when the Earth appears dry and in the Beginning of *March* the Pots should be removed out of the Stove, and placed into a fresh Bark Bed under Frames, which will bring up the Plants soon after.

When the Plants are about two Inches high, they should be carefully taken out of the Pots, and each planted into a separate small Pot filled with light rich Earth, and then plunged into the hot Bed again; shade them from the Sun, until they have taken new Root, after which Time they should be duly watered, and in warm Weather must have a large share of fresh Air. In this hot Bed the Plants may remain until Autumn, when the Nights begin to be cold; at which Time they should be removed into the Stove, and plunged into the Bark Bed. During the Winter these Plants must be kept warm, especially while they are young, and frequently refreshed with Water; but it must not be given in large Quantities, lest it rot the tender Fibres of their Roots. It will be proper to continue these Plants in the Stove all the Year, but in warm Weather they should have a large Share of Air; as the Plants grow in Strength, they will be more hardy, and may be more exposed in Summer, and in Winter will live in a dry Stove, if kept in a moderate Degree of Heat.

MURUCUIA. See *Passiflora*.

MUSA. Plum. Nov. Gen. 24. Tab. 34. Lin. Gen. Plant. 1010. The Plantain Tree.

The Characters are,

It hath male and female Flowers upon the same Stalk, several of which are hermaphrodite; these are produced on a single Stalk (or Spadix) the male Flowers are situated on the upper Part of the Spike, and the female below; these are in Bunches, each Bunch having a Sheath, or Cover, which falls off. The Flowers are of the Lip Kind. The Petals constitute the upper Lip, and the Nectarium the under; they have six Awl-shaped Stamina, five of which are situated in the Petal, and the sixth in the Nectarium; this is double the Length of the other, terminated by a linear Summit, the others have none. The Germen is situated under the Flower, which is long, having three obtuse Angles supporting an erect cylindrical Style, crowned by a roundish Stigma. The Germen turns to an oblong three cornered fleshy Fruit, covered with a thick Rind, divided into 3 Parts.

The Species are.

1. *MUSA spadice nutante, fructu longiore triquetra*. Musa with a nodding Spike, and a long three-cornered Fruit. This is the *Musa fructu cucumerino longiori*. Plum. Nov. Gen. 24. Musa with a longer Cucumber-shaped Fruit, commonly called, Plantain Tree.

2. *MUSA spadice nutante, fructu brevior obtuse-angulo*. Musa with a nodding Spike, and a short Fruit with obtuse Angles. This is the *Musa fructu cucumerino breviora*. Plum. Nov. Gen. 24. Musa with a shorter Cucumber-shaped Fruit, commonly called, Banana.

The 1st Sort is cultivated in all the Islands of the *West-Indies*, where the Fruit serves the Negroes for Bread, and some of the white People prefer it to the Yams, and *Cassada* Bread.

This Plant rises with a soft herbaceous Stalk, 15 Feet and upward; the lower Part of the Stalk, is often as large as a Man's Thigh, diminishing gradually to the Top, where the Leaves come out on every Side; these

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are

are often six Feet long, and near two Feet broad, with a strong fleshy Mid-rib, and a great Number of transverse Veins running from the Mid-rib to the Borders. The Leaves are thin and tender, so that where they are exposed to the open Air; they are generally torn by the Wind, for as they are large, it has great Power against them; these Leaves come out from the Center of the Stalk, and are rolled up at their first Appearance, but when they are advanced above the Stalk, they expand quite flat, and turn backward; as these Leaves come up rolled in the Manner before mentioned, their Advance upward is so quick, that their Growth may almost be discerned by the naked Eye, and if a fine Line is drawn cross, level with the Top, of the Leaf, in an Hour's Time the Leaf will be near an Inch above it. When the Plant is grown to its full Height, the Spike of Flowers will appear in the Center, which is often near 4 Feet in Length, and nods on one Side. The Flowers come out in Bunches, those on the lower Part of the Spike being the largest; the others diminish in Size upward; each of these Bunches is covered with a Sheath, of a fine purple Colour within, which drops off when the Flowers open. The upper Part of the Spike is made up of barren Flowers, which are not succeeded by Fruit, but fall off with their Covers. The Fruit of this is 8 or nine Inches long, and above an Inch Diameter, a little incurved, and has three Angles; it is at first green, but when ripe, of a pale yellow Colour. The Skin is tough, and within is a soft Pulp of a luscious sweet Flavour. The Spikes of Fruit are often so large, as to weigh forty Pounds.

The Fruit of this Sort is generally cut before it is ripe, and roasted in Embers, then is eaten instead of Bread. The Leaves are used for Napkins and Table Cloths, and are Food for Hogs.

The 2d Sort commonly called *Banana*, differs from the first, in having its Stalks marked with dark purple Stripes and Spots. The Fruit is shorter, straiter, and rounder; the Pulp softer, and of a more luscious Taste, so is eaten by way of Desert, and seldom used as the Plantain, therefore is not cultivated in such Plenty.

Both these Plants were carried to the *West-Indies*, from the *Canary Islands*, to which Place it is believed they were carried from *Guinea*, where they grow naturally; these Plants are also cultivated in *Egypt*, and in most other hot Countries, where they grow to Perfection in about ten Months, from their first planting, to the ripening of their Fruit; their Stalks are then cut down, and several Suckers rise from the Root, which will also produce Fruit in ten Months after, so that by cutting down the Stalks at different Times, there is a constant Succession of Fruit all the Year.

In *Europe* these Plants are preserved in the Gardens of the curious, who have hot Houses capacious enough for their Reception, in many of which they have ripened their Fruit very well; but as they grow very tall, and their Leaves large, they require more Room in the Stove, than some care to allow them; they are propagated by Suckers, which come from the Roots of those Plants which have fruited; and many Times the younger Plants, when stunted in Growth, will put out Suckers; these should be carefully taken off, preserving some Fibres to their Roots, and planted in Pots filled with light rich

Earth, and plunged into the Tan Bed in the Stove; these may be taken off any Time in Summer, and it is best to take them off when young, because if their Roots are grown large, they do not put out new Fibres so soon, and when the thick Part of the Root is cut in taking off, the Plants often rot.

During the Summer these Plants must be plentifully watered, for the Surface of their Leaves being large, there is a great Consumption of Moisture, by Perspiration, in hot Weather, but in Winter they must be watered more sparingly, though at that Season they must be often refreshed with a little at a time.

The Pots for these Plants should be large, in Proportion to the Size of the Plant, for their Roots extend pretty far, and the Earth should be rich and light. The Degree of Heat in which they thrive best, is much the same with the *Anana*, or Pine Apple, in which I have had many of these Plants produce their Fruit in Perfection, and they were near 20 Feet high.

The most sure Method to have these Plants fruit in *England*, is, after they have grown for some Time in Pots, and have made good Roots, to shake them out of the Pots with the Ball of Earth to their Roots, and plant them into the Tan Bed in the Stove, observing to lay a little old Tan near their Roots, for the Fibres to strike into, and in a few Months the Roots will extend themselves many Feet each Way in the Bark, and the Plants will thrive a great deal faster, than those which are confined in Pots, or Tubs. When the Bark Bed wants to be renewed with fresh Tan, great Care must be taken not to cut or break the Roots, also to leave a large Quantity of the old Tan about them, because, if the new Tan is laid too near them, it will scorch their Roots, and injure them; these Plants must be plentifully supplied with Water, otherwise they will not thrive; in Winter they should be watered twice a Week, giving at least a Gallon to each Plant, but in Summer they must have it every other Day, and double the Quantity each Time. If the Plants push out their Flower Stems in the Spring, there will be Hopes of their perfecting Fruit, but when they come out late in the Year, the Plants sometimes decay before the Fruit is ripe. The Stoves in which these Plants are placed, should be at least 20 Feet High, otherwise there will not be Room for their Leaves to expand; for when the Plants are in Vigour, the Leaves are often 8 Feet Long, and near three Feet broad; so that if the Stems grow to be 14 Feet to the Division of the Leaves, and the House is not 20 Feet high, the Leaves will be cramped, which will retard the Growth of the Plants; besides, when the Leaves are bent against the Glass, there will be Danger of their breaking them, when they are growing vigorously; for I have had, in one Night, the Stems of such bent Leaves force through the Glass, which the next Morning were advanced two or three Inches above the Glass.

I have seen some Bunches of Fruit of the first Sort, which were upward of 40 Pounds Weight, and perfectly ripe in *England*; but this is not so good a Fruit, as to tempt any Person to be at the Expence of raising them in *England*; the 2d Sort is preferred to the 1st, for the Flavour of its Fruit, in all hot Countries were these Plants abound; the Bunches are not near so large as those of the first Sort, nor are the single Fruit near so long; these

these change to a deeper yellow Colour, as they ripen, but their Taste is somewhat like that of mealy Figs. Some Persons who have resided in the *West-Indies*, having eat of the Fruit, which were produced in *England*, have thought them little inferior to those which grew in *America*; and I imagine, that the Inhabitants of those Countries would not esteem these Fruits so much, had they Variety of other Sorts; but, for want of better, they eat many Kinds of Fruit, which would not be valued in *Europe*, could they be obtained in Perfection.

MUSCARI. *Tourn. Inst. R. H.* 347. *Tab.* 180. Musc, or Grape Hyacinth, *vulg.*

The Characters are,

The Flower has no Empalement. It hath one oval Pitcher-shaped Petal, reflexed at the Brim. It hath 3 Nectariums on the Top of the Germen, and 6 Awl-shaped Stamina, which are shorter than the Petal, whose Summits join together, and in the Center is situated a roundish three cornered Germen, supporting a single Style, crowned by an obtuse Stigma. The Germen turns to a roundish three-cornered Capsule, having 3 Cells filled with roundish Seeds.

The Species are,

1. MUSCARI *corollis globosis uniformibus, foliis canaliculato-cylindricis.* Muscari with uniform globular Petals, and cylindrical Gutter-shaped Leaves. This is the *Muscari arvense, juncifolium, caeruleum, minus.* *Tourn. Inst.* 348. Smaller blue Field Muscari with Rush Leaves, commonly called, Grape Hyacinth.

2. MUSCARI *corollis angulato-cylindricis, summis sterilibus longius pedicellatis.* Muscari with angular cylindrical Petals, which on the Top of the Spike are barren, and have longer Foot Stalks. *Muscari arvense, latifolium, purpurascens.* *Tourn. Inst.* 347. Broad leaved purple Field Muscari, commonly called, Fair-haired Hyacinth.

3. MUSCARI *corollis ovatis.* Muscari with oval Petals. This is the *Muscari obsoletiore flore.* *Clus. Hist.* 1. p. 178. Muscari with an obsolete Flower, commonly called, Musk Hyacinth.

4. MUSCARI *floribus paniculatis monstrosis.* Muscari with monstrous Flowers growing in Panicles. This is the *Hyacinthus paniculâ caeruleâ.* *C. B. P.* 42. Blue Feathered Hyacinth.

5. MUSCARI *paniculâ ramosâ, floribus monstrosis.* Muscari with a branching Panicle, and monstrous Flowers. This is the *Hyacinthus comosus ramosus, elegantior.* *Ger.* 117. Fair-curved hairy branched Hyacinth.

6. MUSCARI *corollis irregularibus sexpartitis.* *Lin. Sp.* Muscari with irregular Petals, cut into six Parts. *Hyacinthus orbioides Africanus major bifolius maculatus, flore sulphureo, obsoleto majore.* *Breyn. Prod.* Greater African Hyacinth, resembling *Orchis*, with two spotted Leaves, and a larger obsolete Sulphur-coloured Flower.

The 1st Sort grows naturally in the Vineyards and arable Fields, in *France, Italy, and Germany*, and where once planted in a Garden, is not easily rooted out, for the Roots multiply greatly, and if permitted to scatter their Seeds, the Ground will be filled with Roots; there are 3 Varieties of this, one with blue, another with white, and a third with Ash-coloured Flowers; this hath a small round bulbous Root, from which come out many Leaves, about six Inches long, which are narrow, and their Edges incurved, and shaped like a Gutter; between these arise the Flower Stalk, which is naked, and toward

the Top garnished with a close Spike of blue Flowers; shaped like Pitchers, sitting very close to the Stalk; these smell like fresh Starch, or the Stones of fresh Plums. They flower in *April*, and the Seeds ripen the latter End of *June*.

The 2d Sort grows naturally in *Spain and Portugal*, from whence I have received both Roots and Seeds; this hath a bulbous Root, as large as a middling Onion, from which come out 5 or 6 Leaves, a Foot long, and three Quarters of an Inch broad at their Base, diminishing gradually to a Point. The Flower Stalk rises about a Foot high, naked the lower half, but the upper is garnished with cylindrical, angular, purple Flowers, standing upon Foot Stalks Half an Inch long; these grow horizontally, but the Stalk is terminated by a Tuft of Flowers, whose Petals are oval, and have neither Germen, or Style, so are barren. This Sort flowers the latter End of *April*, or Beginning of *May*; there is a Variety of this with white, and another with blue Flowers, but the purple is most common.

The 3d Sort hath pretty large, oval, bulbous Roots, from which arise several Leaves about 8 or 9 Inches long, and half an Inch broad; they are incurved a little on their Sides, and end in obtuse Points; these embrace each other at their Base; out of the Middle of these, the Stalk which sustains the Flowers arises; they are naked below, but their upper Parts are garnished with small Flowers growing in a Spike; these have oval Pitcher-shaped Petals, reflexed at their Brim, and are of an Ash-coloured purple, seeming as if faded, but have an agreeable musky Scent; the Stalks do not rise more than six Inches high, so the Flowers make no great Appearance, but where they are in some Quantity, they perfume the Air to a considerable Distance. This Sort flowers in *April*, and the Seeds ripen in *July*.

Of this there are two Varieties, one of which has the same coloured Flowers with this here enumerated on the lower Part of the Spike but they are larger, and have more of the purple Cast, but the Flowers on the upper Part of the Spike are yellow, and have a very grateful Odour. The *Dutch* Gardeners title it *Dipcade Muscari*. As this is supposed to be only a seminal Variety of the third, I have not enumerated it as distinct. Another Variety of this with very large yellow Flowers has been lately raised from Seeds in *Holland*, which the Florists there sell for a Guinea a Root.

The 4th Sort hath a large bulbous Root, from which come out several plain Leaves, a Foot long, and about half an Inch broad at their Base; they are smooth, and end in obtuse Points. The Flower Stalks rise near a Foot and a Half high; they are naked at the Bottom for about 7 or 8 Inches, above which the Panicles of Flowers begin, and terminate the Stalks. The Flowers stand on Foot Stalks, which are more than an Inch long, each sustaining 3, 4 or 5 Flowers, whose Petals are cut into slender Filaments, like Hairs; they are of a purplish blue Colour, and have neither Stamina or Germen, so never produce Seeds. It flowers in *May*; after the Flowers are past, the Stalks and Leaves decay to the Root, and new ones rise the following Spring.

The 5th Sort has a round solid bulbous Root, covered with a purple Skin. The Leaves are about the same Length with those of the former Sort, but nar-

tower, and their Borders incurved, so are formed Gutter Fashion. The Stalks rise about a Foot high, but are slender, so unless they are supported, they decline toward the Ground, especially when the Flowers come out; these have 2 or 3 long narrow Leaves, at about 3 Inches from the Ground, but are naked above to the Panicle, which is much shorter than that of the former Sort, but branches out wide on every Side. The Petals of the Flower are cut into finer Filaments, which turn back, like the Curls of Hair; these have neither Stamina, or Style, so never produce Seeds; they are of a dark purple Colour, and appear in *May*; in *July* the Stalks and Leaves decay to the Root; this has been an old Inhabitant of the *English* Gardens, but from whence it originally came, is not easy to trace.

The 6th Sort grows naturally at the *Cape of Good Hope*, from whence I received the Seeds, which succeeded in the *Chelsea* Garden, and the Plants have flowered for several Years past; this hath a small, white, bulbous Root, about the Size of a Hazel Nut, from which come out generally but two (though sometimes when the Roots are strong) three Leaves, which are five or six Inches long, and one Inch and a Half broad in the Middle, ending in obtuse Points; these are of a lucid green, and have many Spots, or Protuberances on their upper Surface. The Flower Stalk rises between them to the Height of 6 or 7 Inches; it is round, smooth, and naked for 3 Inches high, or more, and is terminated by a Spike of Flowers, of a pale Sulphur Colour; these have no Foot Stalks; they have one Petal, of an irregular Figure, and cut at the Top into six Parts. The Stamina are almost equal with the Petal, and stand round the Style, which is of the same Length. The Flowers appear in *March*, but are seldom succeeded by Seeds here.

The first five Sorts are very hardy, so will thrive in the open Air, and require the same Culture of other hardy bulbous rooted Flowers, which is to take up their Roots every second or third Year, to separate their Bulbs, for as some of the Sorts multiply fast, so when they become large Bunches, they do not flower so strong, as when they are single; the best Time to take them out of the Ground, is soon after their Stalks and Leaves are decayed; then they should be spread on a Mat, in a dry shady Room for a Fortnight to dry, after which they may be kept in Boxes like other bulbous Roots, till *Michaelmas*, when they may be planted again in the Borders of the Flower Garden, and treated as the common hardy Kinds of Hyacinths.

The 1st Sort should not be admitted into the Flower Garden, because the Roots propagate so fast, as to become a troublesome Weed there.

The 2d Sort has but little Beauty, so a few only should be allowed a Place merely for Variety; this is so hardy, as to thrive in any Soil or Situation.

The 3d Sort merits a Place for the extreme Sweetness of its Flowers, but especially that Variety of it with yellow Flowers, called *Dipsade*.

The 4th and 5th Sorts may also be allowed a Place in the Borders of the Pleasure Garden, where they will add to the Variety, and are by no Means to be despised.

They are all easily propagated by Offsets, which their Roots send out in great Plenty, so there is little Occasion for sowing their Seeds, unless to gain new Varieties.

The 6th Sort is too tender to thrive in the open Air in *England*, so the Roots must be planted in small Pots, filled with light rich Earth, and placed in Autumn under a hot Bed Frame, where they may be protected from Frost, but should have as much free Air as possible in mild Weather; for when they are placed in a Greenhouse, their Leaves are drawn long and narrow, and the Flower Stalks are generally weak, so never flower so well as when they have Plenty of free Air. These Flowers will continue a Month where they are not drawn, but decay in half that Time in a Greenhouse.

These Roots should be transplanted in *July*, when their Stalks and Leaves are decayed, and placed in the open Air during the Summer Season, but should have very little Water when their Leaves are decayed.

MUSCIPULA. See *Silene*.

MUSCOSE, Mossy, or abounding with Moss.

MUSCOSITY, Mossiness.

MUSCUS, Moss.

These, though formerly supposed to be only Excrecencies produced from the Earth, Trees, &c. yet are no less perfect Plants than those of greater Magnitude, having Roots, Branches, Flowers, and Seeds, but yet cannot be propagated from the latter by any Art.

The Botanists distinguish these into several Genera, under each of which are several Species; but as they are Plants of no Use or Beauty, it would be to no Purpose to enumerate them in this Place.

These Plants chiefly flourish in cold Countries in the Winter Season, and are many Times very injurious to Fruit Trees, which grow on cold barren Soils, or where they are so close planted as to exclude the free Access of Air. The only Remedy in such Cases is to cut down Part of the Trees, and plough up the Ground between those left remaining; and in moist Weather in Spring you should, with an Iron Instrument made a little hollow, the better to surround the Branches of the Trees, scrape off the Moss, carrying it off the Place; and by two or three Times thus cleansing them, together with carefully stirring the Ground, it may be entirely destroyed; but if you do not cut down Part of the Trees, and stir the Ground well, the rubbing off the Moss will signify little; for the Cause not being removed, the Effect will not cease, for the Moss will in a short Time be as troublesome as ever.

MUSHROOMS are, by many Persons, supposed to be produced from the Putrefaction of the Dung, Earth, &c. in which they are found; but notwithstanding this Notion is generally received among the unthinking Part of Mankind, yet by curious Naturalists, they are esteemed perfect Plants, though their Flowers and Seeds have not as yet, been perfectly discovered. But since they may, and are annually propagated by the Gardeners near *London*, and are greatly esteemed by most curious Palates, I shall briefly set down the Method practised by those who cultivate them for Sale.

But first, it will not be improper to give a short Description of the true eatable Kind, since there are several unwholesome Sorts, which have been by unskilful Persons gathered for the Table.

The true Champignon, or Mushroom, appears at first of a roundish Form, like a Button; the upper Part of which, as also the Stalk, is very white; but being opened,

opened, the under Part is of a livid Flesh Colour; but the fleshy Part, when broken, is very white; when these are suffered to remain undisturbed, they will grow to a large Size, unfolding themselves almost Flat, and the red Part underneath will change to a dark Colour.

In order to cultivate them, if you have no Beds in your own, or in neighbouring Gardens, which produce them, you should look abroad in rich Pastures, during the Months of *August* and *September*, until you find them (that being the Season when they are naturally produced); then you should open the Ground about the Roots of the Mushrooms; where you will find the Earth, very often, full of small white Knobs, which are the Offsets, or young Mushrooms; these should be carefully gathered, preserving them in Lumps with the Earth about them: But as this Spawn cannot be found in the Pasture, except at the Season when the Mushrooms are naturally produced, you may probably find some in old Dung-hills, especially where there has been much Litter amongst it, and the Wet hath not penetrated to rot it; as likewise, by searching old hot Beds, it may be often found; for this Spawn has the Appearance of a white Mold, shooting out in long Strings, by which it may be easily known, where-ever it is met with: Or this may be procured by mixing some long Dung from the Stable, which has not been thrown on a Heap to ferment; which being mixed with strong Earth, and put under Cover to prevent Wet getting to it, the more the Air is excluded from it, the sooner the Spawn will appear; but this must not be laid so close together as to heat, for that will destroy the Spawn: In about two Months after, the Spawn will appear, especially if the Heap is closely covered with old Thatch, or such Litter as hath lain long abroad, so as not to ferment, then the Beds may be prepared to receive the Spawn: These Beds should be made of Dung, in which there is good Store of Litter, but this should not be thrown on a Heap to ferment; that Dung which hath lain spread abroad for a Month or longer, is best; these Beds should be made on dry Ground, and the Dung laid upon the Surface; the Width of these Beds at Bottom should be about two Feet and a Half or three Feet, the Length in Proportion to the Quantity of Mushrooms desired; then lay the Dung about a Foot thick, covering it about four Inches with strong Earth. Upon this lay more Dung, about ten Inches thick; then another Layer of Earth, still drawing in the Sides of the Bed, so as to form it like the Ridge of a House, which may be done by three Layers of Dung and as many of Earth. When the Bed is finished, it should be covered with Litter or old Thatch, to keep out Wet, as also to prevent it's drying; in this Situation it may remain eight or ten Days, by which Time the Bed will be in a proper Temperature of Warmth to receive the Spawn; for there should be only a moderate Warmth in it, great Heat destroying the Spawn, as will also Wet; therefore when the Spawn is found, it should always be kept dry until it is used, for the drier it is, the better it will take in the Bed; I had a Parcel of this Spawn, which had lain near the Oven of a Stove upward of four Months, and was become so dry, that I despaired of its Success; but I have never yet seen any which produced so soon, nor in so great Quantity.

The Bed being in a proper Temperature for the

Spawn, the Covering of Litter should be taken off, and the Sides of the Bed smoothed; then a Covering of light rich Earth, about an Inch thick, should be laid all over the Bed, but this should not be wet; upon this the Spawn should be thrust, laying the Lumps two or three Inches asunder; then gently cover this with the same light Earth, above half an Inch thick, and put the Covering of Litter over the Bed, laying it so thick as to keep out Wet, and prevent the Bed from drying: When these Beds are made in the Spring or Autumn, as the Weather is in those Seasons temperate, the Spawn will then take much sooner, and the Mushrooms will appear perhaps in a Month after making; but those Beds which are made in Summer, when the Season is hot, or in Winter, when the Weather is cold, are much longer before they produce.

The great Skill in managing these Beds is, that of keeping them in a proper Temperature of Moisture, never suffering them to receive too much Wet: During the Summer Season, the Beds may be uncovered to receive gentle Showers of Rain at proper Times; and in long dry Seasons they should be now and then gently watered, but by no means suffer much Wet to come to them; during the Winter Season they must be kept as dry as possible, and so closely covered as to keep out Cold. In frosty or very cold Weather, if some warm Litter out of a Dung Heap is laid on, it will promote the Growth of the Mushrooms; this must not be laid next the Bed, but a Covering of dry Litter between the Bed and this warm Litter; as often as the Litter is found to decay, it should be renewed with fresh; and as the Cold increases, the Covering should be laid so much thicker. If these Things are observed, there may be Plenty of Mushrooms produced all the Year; and these produced in Beds, are much better for the Table than any of those which are gathered in the Fields.

A Bed thus managed, if the Spawn takes kindly, will continue good for several Months, and produce great Quantities of Mushrooms; from these Beds when they are destroyed, you should take the Spawn for a fresh Supply, which may be laid up in a dry Place until the proper Season of using it; which should not be sooner than five or six Weeks, that the Spawn may have Time to dry before it is put into the Bed, otherwise it will not succeed well.

Sometimes it happens, that Beds thus made do not produce any Mushrooms till they have lain five or six Months, so that these Beds should not be destroyed, though they should not at first answer Expectation; for I have frequently known these to have produced great Quantities of Mushrooms afterward, and have continued a long Time in Perfection.

MUSTARD. See *Sinapi*.

MYAGRUM. *Tourn. Inst. R. H.* 211. *Tab.* 99. *Lin. Gen. Plant.* 713. Gold of Pleasure.

The Characters are,

The Emplacement of the Flower is composed of 4 oblong, oval, coloured Leaves, which fall off. The Flower hath 4 roundish obtuse Petals, placed in Form of a Cross. It hath 6 Stamina the Length of the Petals, four of which are a little longer, terminated by single Summits. In the Center is situated an oval Germen, supporting a slender Style, crowned by an obtuse Stigma. The Germen becomes a turbinate,

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a turbinate Heart-shaped, little Pod, having two Valves with the rigid Style on the Top, inclosing roundish Seeds.

The Species are,

1. MYAGRUM *filiculis ovatis, pedunculatis polyspermis*. Hort. Cliff. 328. Myagrums with oval Pods having Foot Stalks, and inclosing one Seed. This is the *Alysson segetum foliis auriculatis acutis*. Tourn. Inst. R. H. Corn Madwort with eared acute-pointed Leaves, commonly called Gold of. Pleasure.

2. MYAGRUM *filiculis cordatis pedunculatis polyspermis, foliis denticulatis obtusis*. Myagrums with Heart-shaped Pods standing on Foot Stalks, having many Seeds and indented Leaves. This is the *Alysson segetum foliis auriculatis acutis fructu majori*. Tourn. Corn Madwort, with acute-eared Leaves and a larger Fruit.

3. MYAGRUM *filiculis globosis compressis punctato-rugosis*. Hort. Cliff. 328. Myagrums with globular, compressed small Pods, having rough Punctures. This is the *Rapistrum arvense, folio auriculato acuto*. Tourn. Inst. 211. Field Charlock with an acute-eared Leaf.

4. MYAGRUM *filiculis biarticulatis dispermis, foliis extrorsum sinuatis denticulatis*. Hort. Upsal. 182. Myagrums with short Pods, having two Joints, two Seeds, and outer Leaves sinuated and indented. This is the *Rapistrum monospermum*. C. B. P. One seeded Charlock.

5. MYAGRUM *filiculis cordatis subfissilibus, foliis amplexicaulibus*. Hort. Upsal. 182. Myagrums with small Heart-shaped Pods sitting close to the Stalk, and the Leaves embracing it. This is the *Myagrums monospermum latifolium*. C. B. P. 109. Broad leaved Myagrums having one Seed in a Pod.

The 1st Sort grows naturally in Corn Fields in the South of France and Italy; I have also found it growing in the Corn in Easthamsted Park, the Seat of William Trumbull, Esq; but it is not common in this Country. It is an annual Plant with an upright Stalk, about a Foot and a Half high, sending out 2 or 4 Side Branches toward the Top, which grow erect; they are smooth, and have a fungous Pith; the lower Leaves are from 3 to 4 Inches long, of a pale or yellowish green, and eared at their Base; those on the Stalks diminish in their Size all the Way up, and are entire, and almost embrace the Stalks with their Base. The Flowers grow in loose Spikes at the End of the Branches, standing on Foot Stalks an Inch long; they are composed of 4 small yellowish Petals, placed in Form of a Cross; these are succeeded by oval Capsules, bordered and crowned at the Top with the Style of the Flower; these have two Cells, filled with red Seeds.

The 2d Sort is also annual, and differs from the first in having a taller Stalk; the Leaves are much longer, narrower, and regularly indented on their Edges, ending in obtuse Points. The Flowers are larger, but of the same Form and Colour; the Capsules are much larger, and shaped like a Heart. Both Sorts flower in June and July, and their Seeds ripen in September.

The 3d Sort grows naturally in the South of France and Italy. This is an annual Plant, whose lower Leaves are five or six Inches long; they are hairy and succulent; their Base is eared, and they end in acute Points. The Stalks rise a Foot and a Half high, they are brittle and hairy, branching out toward the Top like the two former, and are terminated by short loose Spikes of small

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pale Flowers, succeeded by small rough, roundish Capsules, compressed at the Top. It flowers in July, and the Seeds ripen in Autumn.

The 4th Sort grows naturally amongst the Corn, in France and Germany. This is also annual, the lower Leaves are large, jagged, and hairy; the Stalks branch out from the Bottom, and are garnished with Leaves about 4 Inches long and 2 broad; they are hairy, and unequally jagged. The Stalks are terminated by very long loose Spikes of yellow Flowers, which are succeeded by short Pods with two Joints, each including one roundish Seed. It flowers about the same Time with the former.

The 5th Sort grows naturally in the South of France and Italy; this hath a smooth Branching Stalk upward of 2 Feet high; the lower Leaves are 5 or 6 Inches long, smooth, succulent, and a little indented; the upper Leaves almost embrace the Stalks with their Base. The Flowers are produced in long loose Spikes, which are yellow and sit close to the Stalk; these are succeeded by Heart-shaped compressed Pods, divided into two Cells by a longitudinal Partition, each containing one roundish Seed. It flowers at the same Time.

If the Seeds of all these Plants are permitted to scatter in Autumn, the Plants will rise without Care and only require to be thinned and kept clean from Weeds. These autumnal Plants will always ripen their Seeds, whereas those sown in Spring sometimes fail.

MYOSURUS, Mousetail.

This Plant is very near akin to the Ranunculus, in which Genus it is ranged by some Botanists; the Flowers are extremely small, and are succeeded by long slender Spikes of Seeds, resembling the Tail of a Mouse, from whence it had the Name. It grows wild upon moist Grounds in divers Parts of England, where it flowers the latter End of April and the Seeds ripen in a Month after, when the Plants decay, being annual. It is never cultivated in Gardens.

MYRICA. Lin. Gen. Plant. 981. Gale. Tourn. Art. Reg. Scien. 1706. The Candlebury Myrtle, vulgò; or Gale, or Sweet Willow; by some Myrtus Brabantica, or Dutch Myrtle; in French, Piment Royal.

The Characters are,

The male Flowers are upon different Plants from the female; the male Flowers are produced in a loose oblong oval Katkin, imbricated on every Side; under each Scale is situated one Moon-shaped Flower, having no Petal, but bath four or six short slender Stamina, terminated by large Twin Summits, whose Lobes are bifid. The female Flowers have neither Petal or Stamina, but an oval Germen supporting two slender Styles, crowned by single Stigmas. The Germen becomes a Berry with one Cell, inclosing a single Seed.

The Species are,

1. MYRICA *foliis lanceolatis subferratis caule fruticoso*. Lin. Sp. Plant. 1024. Myrica with Spear-shaped sawed Leaves and a shrubby Stalk. This is the *Gale frutex odoratus septentrionalium* J. B. Northern shrubby sweet Gale, sweet Willow, Dutch Myrtle, or Gale.

2. MYRICA *foliis lanceolatis integerrimis, caule fruticoso*. Myrica with entire Spear-shaped Leaves, and a shrubby Stalk. This is the *Myrtus Brabantica similis Caroliniensis baccifera, fructu racemoso sessili monopyreno*. Pluk. Phyt. Carolina Myrtle like that of the Dutch, with Berries

Berries growing in Bunches, and sitting close to the Stalks, commonly called Candleberry Myrtle.

3. MYRICA *foliis lanceolatis serratis, caule fruticosâ*. Myrica with Spear-shaped sawed Leaves, and a shrubby Stalk. This is the *Myrtus Brabantica similis Carolinensis bumilior, foliis latioribus & magis serratis*. *Catesb. Car.* Vol. I. p. 13. Lower Carolina Myrtle or Candleberry Tree, resembling that of Brabant, having broader Leaves which are more sawed.

4. MYRICA *foliis oblongis alternatim sinuatis*. Hort. Cliff. 456. Myrica with oblong Leaves alternately sinuated. This is the *Gale Mariana, Asplenii folio*. Pet. Musf. 773. Maryland Gale with a Spleenwort Leaf.

5. MYRICA *foliis oblongis oppositè sinuatis glabris*. Myrica with oblong smooth Leaves oppositely sinuated. This is the *Laurus Africana minor, folio quercus*. Hort. Amst. Smaller African Bay with an Oak Leaf.

6. MYRICA *foliis oblongis oppositè sinuatis birsutis*. Myrica with oblong hairy Leaves oppositely sinuated.

7. MYRICA *foliis subcordatis serratis sessilibus*. Hort. Cliff. 456. Myrica with sawed Leaves which are almost Heart-shaped, and sit close to the Stalk. This is the *Gale Capensis, ilicis cocciferae folio*. Pet. Musf. 774. Gale from the Cape, with a Leaf like the Kermes Oak.

The 1st Sort grows naturally on Bogs in England, particularly in the northern and western Countries, also in Windsor Park, and near Tunbridge Wells. This rises with many shrubby Stalks near 4 Feet high, which divide into several slender Branches garnished with stiff Spear-shaped Leaves, about an Inch and a Half long, and half an Inch broad in the Middle; they are of a light yellowish green, smooth, a little sawed at their Points, and emit a fragrant Odour when bruised; they are placed alternately on the Branches. The male Flowers or Katkins, are produced from the Side of the Branches, growing on separate Plants from the female, which are succeeded by Clusters of small Berries, each having a single Seed. It flowers in July, and the Seeds ripen in Autumn.

The Leaves of this Shrub has been by some Persons gathered and used for Tea, but it is generally supposed to be hurtful to the Brain; but from this Use of it, a learned Physician a few Years since, wrote a Treatise to prove this to be the true Tea, in which he has only shewn his Want of Knowledge in these Things.

It grows naturally on Bogs, and cannot be made to thrive on dry Land, so is seldom preserved in Gardens.

The 2d Sort grows naturally in North America, where the Inhabitants get a Sort of green Wax from the Berries, which they make into Candles. The Method of collecting and preparing this, is described by Mr. Catesby, in his *History of Carolina*.

This grows naturally on Bogs and swampy Lands, where it rises with many strong shrubby Stalks 7 or 8 Feet high, sending out several Branches, which are garnished with stiff Spear-shaped Leaves near 3 Inches long, and one broad in the Middle; they are smooth and entire, having scarce any Foot Stalks, of a yellowish lucid green on their upper Side, but paler on their under, standing alternately, and pretty close to the Branches; these have a very grateful Odour when bruised. The Katkins come out upon different Plants from the Berries, these are about an Inch long, standing erect.

The Female Flowers come out on the Side of the Branches in longish Bunches, which are succeeded by small roundish Berries, covered with a Sort of Meal. This Shrub delights in a moist soft Soil, and lives in the open Air without any Protection.

The 3d Sort grows naturally in Carolina; this doth not rise so high as the former, the Branches are not so strong, and they have a grayish Bark; the Leaves are shorter, broader, and are sawed on their Edges, but in other Respects is like the second Sort; the Berries of this are also collected for the same Purpose.

These Sorts are propagated by Seeds, which should be sown in Autumn, and then the Plants will come up the following Spring; but if they are kept out of the Ground till Spring, they seldom grow till the Year after. The Plants require Water in dry Weather, and should be screened from Frosts while young, but when they have obtained Strength, they will resist the Cold of this Country very well.

The 4th Sort grows naturally in Philadelphia, from whence the Plants have been brought to England; and those planted on a moist Soil, have thriven very well; some of these creep at their Roots and send up Suckers plentifully, as in their native Soil.

This rises with slender shrubby Stalks near 3 Feet high, which are hairy, and divide into several slender Branches, garnished with Leaves from 3 to 4 Inches long, and half an Inch broad; they are alternately indented almost to the Mid-rib, and have a great Resemblance to those of Spleenwort; they are of a dark green, hairy on the under Side, and sit close to the Stalks. The male Flowers or Katkins, come out on the Side of the Branches between the Leaves, these are oval and stand erect. I have not seen any of these Plants in Fruit, so can give no Description of it.

This Sort will propagate by Suckers sent out from the Roots, and planted in a loose moist Soil; it endures the Cold as well as the two former Sorts.

The 5th and 6th Sorts grow naturally at the Cape of Good Hope; these only differ in one having very smooth shining Seeds, and those of the other are hairy. I do not know if they are different Species, but I received them from Holland as such, and the Plants still retain their Difference.

This rises with shrubby slender Stalks about 4 Feet high; and divide into smaller Branches, which in one Sort are smooth and in the other are hairy; these are closely garnished with Leaves about an Inch and a Half long, and almost an Inch broad; some having two, others three, deep Indentures on their Sides, which are opposite; in one Sort they are smooth and shining, and in the other they are hairy and of a darker green; they sit close to the Branches, and end in obtuse Points which are indented: Between the Leaves come out some oval Katkins which drop off, so that all the Plants which I have seen have been male, therefore I can give no Account of the Fruit. These retain their Leaves all the Year, but are too tender to live through the Winter in open Air in England, must be placed in the Green house. As these do not produce Seeds here, they are propagated by Layers, but they do not take Root very freely, so the Plants are not very common in Europe at present; for I do not find the Cuttings of these Plants will take Root, having made

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made several Trials of them in all the different Methods; nor have the Dutch Gardeners had better Success, so that the Plants are as scarce there as in England.

In laying the Shoots, that Part which is laid should be tongued at a Joint, as practised in laying Carnations; and the young Shoots only should be chosen for this Purpose, for the old Branches will not put out Roots. These Layers are often two Years before they take Root enough to transplant, for they should not be separated from the old Plants till they have made good Roots, otherwise they are very subject to miscarry.

When they are taken from the old Plants, they should be each put into a separate small Pot, filled with soft, rich, loamy Earth; and if they are placed under a common Frame, shading them from the Sun in the Middle of the Day, it will forward their taking new Root; then they may be placed in a sheltered Situation during the Summer and in Autumn removed into the Greenhouse, and treated as other Plants from the same Country. The best Season for laying the Branches, I have observed to be in July, and by the same Time the following Year, they have been fit to remove.

The 7th Sort is a Native of the Cape of good Hope; this hath a weak shrubby Stalk, which rises 5 or 6 Feet high, sending out many long slender Branches, closely garnished their whole Length with small Heart-shaped Leaves, which sit close to the Branches, and are slightly indented and waved on their Edges. The Flowers come out between the Leaves in roundish Bunches; these are male in all the Plants I have yet seen; they have an uncertain Number of Stamina, and are included in one common scaly Cover. These Flowers appear in July, but make no great Appearance; The Leaves of this Sort continue all the Year.

This is propagated, and requires the same treatment as the two former Sorts, and is as difficult to increase, so is not common in the European Gardens.

MYRRHIS. See Chærophyllum, Scandix, Sison.

MYRTUS. Tourn. Inst. R. H. 640. Tab. 409. Lin. Gen. Plant. 343. Myrtle; in French, Myrte.

The Characters are,

The Empalement of the Flower is of one Leaf, cut into five acute Points at the Top, is permanent, and sits on the Germen. The Flower has five large oval Petals which are inserted in the Empalement, and a great Number of small Stamina which are also inserted in the Empalement, terminated by small Summits. The Germen is situated under the Flower, supporting a slender Style, crowned by an obtuse Stigma. The Germen afterward turns to an oval Berry with three Cells, crowned by the Empalement; each Cell containing one or two Kidney-shaped Seeds.

The Species are,

1. MYRTUS foliis ovatis, pedunculis longioribus. Myrtle with oval Leaves, and longer Foot-Stalks to the Flowers. This is the *Myrtus latifolia Romana*. C. B. P. 468. Broad leaved Roman Myrtle, or common broad leaved Myrtle.

2. MYRTUS foliis lanceolatis acuminatis. Myrtle with Spear-shaped acute pointed Leaves. This is the *Myrtus latifolia Belgica*. C. B. P. 469. Broad leaved Dutch Myrtle.

3. MYRTUS foliis lanceolato-ovatis acutis. Myrtle with Spear-shaped, oval acute-pointed Leaves. This

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is the *Myrtus sylvæstris, foliis acutissimis*. C. B. P. 469. Wild Myrtle with very acute-pointed Leaves.

4. MYRTUS foliis ovato-lanceolatis confertis. Myrtle with oval Spear-shaped Leaves growing in Clusters. This is the *Myrtus latifolia Batia 2 vel foliis laurinis, confertim nascentibus*. C. B. P. 469. Second broad leaved Spanish Myrtle, with Bay Leaves growing in Clusters, commonly called Orange Leaved Myrtle.

5. MYRTUS foliis ovato-lanceolatis acutis, ramis erectioribus. Myrtle with oval, acute-pointed, Spear-shaped Leaves, and erect Branches. This is the *Myrtus communis Italica*. C. B. P. 468. Common Italian Myrtle, called upright Myrtle.

6. MYRTUS foliis ovatis, baccis rotundioribus. Myrtle with oval Leaves and rounder Berries. This is the *Myrtus minor vulgaris*. C. B. P. 469. Common smaller Myrtle, called the Box leaved Myrtle.

7. MYRTUS foliis linear-lanceolatis acuminatis. Myrtle with linear, Spear-shaped, acute-pointed Leaves. This is the *Myrtus foliis minimis & mucronatis*. C. B. P. 469. Myrtle with the smallest sharp-pointed Leaves, commonly called Rosemary leaved Myrtle.

8. MYRTUS pedunculis multifloris, foliis ovatis subpetiolatis. Lin. Sp. P. 472. Myrtle with many Flowers on each Foot-Stalk, and oval Leaves having short Foot Stalks. This is the *Myrtus Zeylanica odoratissima; baccis niveis monococcis*. H. L. 434. Sweet smelling Myrtle of Ceylon, with Snow white Berries containing one Seed.

9. MYRTUS foliis alternis. Flor. Zeyl. 186. Myrtle with alternate Leaves.

The 1st Sort is the common broad leaved Myrtle, which is one of the hardest Kinds we have. The Leaves are an Inch and a Half long, and one Inch broad, of a lucid green, standing on short Foot Stalks. The Flowers come out from the Side of the Branches, on pretty long Foot Stalks: these are succeeded by oval Berries of a dark purple Colour, inclosing 3 or 4 hard Kidney-shaped Seeds. It flowers in July and August, and the Berries ripen in Winter. This Sort is by some called the flowering Myrtle, because it generally has a greater Quantity of Flowers, and those are larger than of any other Sort.

The 2d Sort has Leaves much less than those of the former, and are more pointed, standing closer together on the Branches; the Mid-rib on the under Side of the Leaves is of a purple Colour, they are of a darker green, and sit closer to the Branches. The Flowers are smaller, and have shorter Foot Stalks than those of the first Sort; this flowers a little later in the Summer, and seldom ripens its Berries here.

The double flowering Myrtle I take to be a Variety of this, for the Leaves and Growth of the Plant, the Size of the Flowers, and the Time of flowering, agree better with this than any of the other Sorts.

The 3d Sort grows naturally in the South of France and Italy; the Leaves of this are much smaller than those of the second, being less than an Inch long, and not more than half an Inch broad, of an oval Spear shape, ending in acute Points, of a dull green, and set pretty close on the Branches. The Flowers are smaller than either of the former, and come out from the Wings of the Leaves toward the End of the Branches; the Berries are small and oval.

The 4th Sort has a stronger Stalk and Branches than

than either of the former Sorts, and rises to a greater Height; the Leaves are oval, Spear-shaped, and are placed in Clusters round the Branches; these are of a dark green. The Flowers are of a middling Size, and come out sparingly from between the Leaves; the Berries are oval, and smaller than those of the first Sort, but seldom ripen in *England*. The Gardeners call this the Orange leaved Myrtle, and some, the Bay leaved Myrtle. This Sort is not so hardy as the former.

The 5th Sort is the common *Italian* Myrtle; this hath oval Spear-shaped Leaves, ending in acute Points; the Branches grow more erect than those of either of the former Sorts, as do also the Leaves, from whence it is called by the Gardeners upright Myrtle. The Flowers of this are not large, and the Petals are marked with purple at their Points, while they remain closed; the Berries are small, oval, and of a purple Colour. There is a Variety of this with white Berries, in which it only differs from this; and I believe the Nutmeg Myrtle is only a Variety of this, for I have raised several of the Plants from Seed, many of which were so like the *Italian* Myrtle, as not to be distinguished from it.

The 6th Sort is commonly called the Box leaved Myrtle; the Leaves of this are oval, small, and sit close on the Branches; they are of a lucid green, ending in obtuse Points; the Branches are weak, and frequently hang downward, when they are permitted to grow without shortening, and have a grayish Bark. The Flowers are small and come late in the Summer, the Berries are small and round.

The 7th Sort is called the Rosemary leaved Myrtle and by some the Thyme leaved Myrtle. The Branches of this grow pretty erect; the Leaves are placed close on the Branches, they are small, narrow, and end in acute Points; they are of a lucid green, and have a fragrant Odour when bruised. The Flowers of this are small, and come late in the Season, and are but seldom succeeded by Berries here.

There are some other Varieties of these Myrtles, which are propagated in the Gardens for Sale; but as their Difference has been occasioned by Culture, so it would be multiplying their Titles to little Purpose. Those here enumerated, I believe to be really distinct; for I have raised most of them from Seeds, and have not found them change from one to another, though there has been other small Variations among the Plants.

The 8th Sort is a Native of the Island of *Ceylon*; this is much tenderer than either of the former Sorts, so cannot be kept through the Winter in *England*, without some artificial Heat. This hath a strong upright Stalk, covered with a smooth gray Bark, dividing upward into many slender stiff Branches; these are garnished with oval Leaves placed opposite, which are near two Inches long, and an Inch and a Quarter broad, ending in Points; they are of a lucid green, and have very short Foot Stalks. The Flowers come out at the Ends of the Branches, several of them being sustained upon one common Foot Stalk, which branches out, and each Flower stands on a very slender distinct Foot Stalk; they are very like the Flowers of *Italian* Myrtle, but always appear in *December* and *January*, and are never succeeded by Berries here.

The 9th Sort grows naturally in the Island of *Ceylon*,
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where it rises to be a large Tree; but I doubt of this being a Myrtle, for by the dried Sample which was given me by the late Dr. *William Sherard*, it seems rather to belong to the Genus of Clove; the Flowers growing in Bunches at the End of the Branches like the Pimento, which I suppose occasioned Dr. *Linnaeus* to add the Synonyme of the Pimento from Sir *Hans Sloane* to this Plant, though that is very different from this; for the Leaves of the Pimento are placed opposite on the Branches, whereas these are alternate; and this Error has not been corrected by *Brown* in his *History of Jamaica*, though a Tree of such Consequence as this is to the Inhabitants of that Island, one should have imagined could not be over looked by one who proposed to write a natural History of that Country.

The Leaves of this Tree are eight Inches long and four broad in the Middle, ending in obtuse Points; but those of the Pimento are seldom more than half that Size, and end in acute Points. The Flowers of the dried Sample in my Collection, appear to be all male, which gives me Reason to believe it is allied to the Pimento, which is male and female in different Plants; but as I have not seen any of the fresh Flowers of this Tree, so I cannot be positive, whether this is so or not. The Branches of this Tree come out irregularly, and have a dark brown Bark; the Leaves are placed alternately upon short Foot Stalks; these are shaped like those of the Bay Tree, but are much larger; they have a very strong Mid-rib, and several Veins which come out from the Mid-rib alternately, which diverge to the Edges of the Leaves. The Flowers are produced in loose Bunches at the End of the Branches, several growing upon the same Foot Stalk; they are small, and have several Stamina in each, but they are so closed together in the dried Sample, that their Number cannot be counted; the dried Leaves still retain their Fragrance in a small Degree, though it is very propable, this may have been gathered more than sixty Years.

I shall first treat of the Method of cultivating and propagating the common Sorts of Myrtle, as they all require nearly the same Management; and shall afterward mention that of these two Sorts last mentioned, which require a different Treatment; but as the Varieties of the common Sorts of Myrtle, are cultivated in the Gardens for Sale, I shall just mention the Titles by which they are known, that the Curious may be informed how many there are:

Two Sorts of *Nutmeg Myrtles*, one with a broader Leaf than the other.

The *Bird's Nest Myrtle*, the *Striped Nutmeg Myrtle*, the *Striped upright Myrtle*, the *Striped Rosemary leaved Myrtle*, the *Striped Box leaved Myrtle*, and the *Striped broad leaved Myrtle*.

These Plants may be all propagated from Cuttings, the best Season for which is in the Beginning of *July*, when you should make Choice of the straightest and most vigorous young Shoots, which should be about six or eight Inches long; and the Leaves on the lower Part must be stripped off about two or three Inches high, and the Part twisted which is to be placed in the Ground; then having filled a Parcel of Pots (in Proportion to the Quantity of Cuttings designed) with light rich Earth, you should plant the Cuttings therein, at about two Inches

tance from each other, observing to close the Earth fast about them, and give them some Water to settle it to the Cuttings; then place the Pots under a common hot Bed Frame, plunging them into some old Dung, or Tanners Bark, which will prevent the Earth from drying too fast; but you must carefully shade them with Mats in the Heat of the Day, and give them Air in Proportion to the Warmth of the Season, not forgetting to water them every two or three Days, as you find the Earth in the Pots require it. With this Management, in about six Weeks, the Cuttings will be rooted, and begin to shoot, when you must inure them to the open Air by Degrees, into which they should be removed towards the latter End of *August*, or the Beginning of *September*, placing them in a Situation, where they may be sheltered from cold Winds, in which Place they may remain till the Middle, or latter End of *October*, when the Pots should be removed into the Green-house, and placed in the coolest Part thereof, that they may have Air given to them, whenever the Weather is mild, for they require only to be protected from severe Cold, except the Orange-leaved, and the striped Nutmeg Myrtles, which are somewhat tenderer than the rest, and should have a warmer Situation.

During the Winter Season they must be frequently, but gently watered; and, if any decayed Leaves appear, they should be constantly picked off, as also the Pots kept clear from Weeds, which, if permitted to grow, will soon overspread the young Plants, and destroy them.

If these Pots are placed under a common hot Bed Frame in Winter, where they may be screened from Frost, and have the free Air in mild Weather, the young Plants will succeed better than in a Green-house, provided they do not receive too much Wet, and are not kept closely covered, which will occasion their growing mouldy, and dropping their Leaves.

The Spring following these Plants should be taken out of the Pots very carefully, preserving a Ball of Earth to the Roots of each of them, and every one should be placed in a separate small Pot filled with rich light Earth, observing to water them well to settle the Earth to their Roots, and place them under a Frame until they have taken Root, after which they should be inured to the open Air, and in *May* they must be placed abroad for the Summer, in a sheltered Situation, where they may be defended from strong Winds.

During the Summer Season they will require to be plentifully watered, especially being in such small Pots, which in that Season soon dry; therefore observe to place them where they may receive the Morning Sun; for when they are too much exposed to the Sun in the Heat of the Day, the Moisture contained in the Earth of these small Pots will soon be exhaled, and the Plants greatly retarded in their Growth thereby.

In *August* following examine your Pots, to see if the Roots of the Plants have not made Way out through the Hole in the Bottom of the Pots, which if you observe, you must then shift them into Pots a Size larger, filling them up with the like rich Earth, and observe to trim the Roots which are matted to the Side of the Pots, also to loosen the Earth from the Outside of the Ball with your Hands, some of which should be taken off, that the Roots may the easier find Passage into the fresh Earth;

then water them well, and place the Pots in a Situation where they may be defended from strong Winds; at this Time you may trim the Plants, in order to reduce them to a regular Figure; and if they are inclinable to make crooked Stems, thrust down a slender strait Stick close by them, to which their Stems should be fastened, so as to bring them upright.

If Care be taken to train them thus while they are young, the Stems afterward, when they have acquired Strength, will continue strait without any Support, and their Branches may be pruned, so as to form either Balls or Pyramids, which for such Plants as are preserved in the Green-house, and require to be kept in small Compass, is the best Method to have them handsome; but then these sheered Plants will not produce any Flowers, for which Reason that Sort with double Flowers should not be clipped, because the chief Beauty of that consists in its Flowers; but it will be necessary to suffer a Plant or two of each Kind to grow rude, for the Use of their Branches in Nosegays, &c. for it will greatly deface those which have been constantly sheered to cut off their Branches.

As these Plants advance in Stature, they should annually be removed into larger Pots, according to the Size of their Roots, but you must be careful not to put them into Pots too large, which will cause them to shoot weak, and many Times prove the Destruction of them, therefore when they are taken out of the former Pots, the Earth about their Roots should be pared off, and that within Side the Ball must be gently loosened, that the Roots may not be too closely confined; and then place them into the same Pots again, provided they are not too small, filling up the Sides and Bottom of them with fresh rich Earth, and giving them Plenty of Water to settle the Earth to their Roots, which should be frequently repeated, for they require to be often watered both in Winter and Summer, but in hot Weather they must have it in Plenty.

The best Time for shifting these Plants is either in *April*, or *August*, for if it be done much sooner in the Spring, the Plants are then in a slow growing State, and not so able to strike out fresh Roots again very soon, and if it be done later in Autumn, the cold Weather coming on will prevent their taking Root; nor is it advisable to do it in the great Heat of Summer, because they will require to be very often watered, also to be placed in the Shade, otherwise they will be liable to droop for a considerable Time; and that being the Season when these Plants are placed among other Exoticks, to adorn the several Parts of the Garden, these Plants, being then shifted, could not be exposed until they have taken Root again, which, at that Time (if the Season be hot and dry) will be three Weeks, or a Month.

In *October*, when the Nights begin to be frosty, remove the Plants into the Green house, but if the Weather proves favourable (as it often happens,) they may remain abroad until the Beginning of *November*, for if they are carried into the Green-house too soon, and the Autumn should prove warm, they will make fresh Shoots at that Season, which will be weak, and often grow mouldy in Winter, if the Weather is so severe as to require the Windows to be kept closely shut, whereby they will be greatly defaced; for which Reason they should:

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should always be kept as long abroad as the Season will permit, and removed out again in Spring, before they shoot out; and during the Winter Season that they are in the Green-house, they should have as much free Air as possible when the Weather is mild.

The three first mentioned Sorts I have seen planted abroad in warm situations, and upon a dry Soil, where they have endured the Cold of our Winters for several Years very well, with only being covered in very hard Frosts with two or three Mats, and the Surface of the Ground about their Roots covered with a little Mulch to prevent the Frost from entering the Ground; but in *Cornwall* and *Devonshire*, where the Winters are more favourable than in most other Parts of *England*, there are large Hedges of Myrtle, which have been planted several Years, and are very thriving and vigorous, some of which are upward of six Feet high, and I believe, if the double flowering Kind was planted abroad, it would endure the Cold as well as any of the other Sorts, it being a Native of the southern Parts of *France*. This, and the Orange-leaved Kind, are the most difficult to take Root from Cuttings; but if they are planted toward the latter End of *June*, making Choice of only such Shoots as are tender, and the Pots are plunged into an old Bed of Tanners Bark which has lost most of its Heat, and the Glasses shaded every Day, they will take Root extremely well, as I have more than once experienced. The Orange-leaved Sort, and those with variegated Leaves, are tenderer than the ordinary Sorts, and should be housed a little sooner in Autumn, and placed farther from the Windows of the Green-house.

The 8th Sort is with Difficulty propagated, which occasions its present Scarcity, for as it does not produce ripe Seeds in *Europe*, it can only be increased by Layers, or Cuttings. The Layers are commonly two Years before they take Root, and the Cuttings frequently fail, though the latter is preferred, when performed at a proper Season, and in a right Method; the best Time to plant the Cuttings is in *May*; in the Choice of them, it should

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be the Shoots of the former Year, with a small Piece of the two Years Wood at Bottom; these should be planted in small Pots, filled with soft loamy Earth, for small Pots are to be preferred to large ones for this Purpose, and they should be plunged into a very moderate hot Bed of Tanners Bark, and if the Pots are each covered with small Bell, or Hand Glasses, such as are used for blowing Carnations, to exclude the Air, it will be of great Service to promote the Cuttings putting out Roots, though they are covered with the Glasses of the hot Bed above them; the Cuttings should be shaded from the Sun, in the Heat of the Day, and gently refreshed with Water, as the Earth in the Pots is found to dry, but they should by no Means have too much Wet; those Cuttings which succeed, will have taken Root by *July*, when they should be gradually inured to bear the open Air, into which it will be proper to remove them about the Middle of that Month, to strengthen them before Winter; but it will not be proper to transplant the Cuttings till Spring, the Pots must be removed into a temperate Stove in Autumn, and during Winter, the Cuttings must be gently refreshed with Water. In Spring, they should be carefully taken up, and each planted in a small Pot filled with light Earth from a Kitchen Garden, and plunged into a moderate hot Bed, to forward their taking fresh Root; then they should be gradually hardened, and in *July* placed in the open Air, in a sheltered Situation, where they may remain till the End of *September*, and then be removed into the Stove.

This Plant will not live through the Winter in *England* in a Green-house, but if it is placed in a moderate Degree of Warmth, it will flower well in Winter; and in *July*, *August*, and *September*, the Plants should be placed abroad in a sheltered Situation.

The 9th Sort is propagated by Seeds, and requires the same Treatment as the *Pimento*, which is fully exhibited under the Article *Caryophyllus*, to which the Reader is desired to turn, to avoid Repetition.

MYRTUS BRABANTICA. See Myrica.

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NAPPELLUS. See Aconitum.

NAPUS. See Brassica and Rapa.

NAPÆA. Lin. Gen. Plant. 748. *Malva*. H. L.

The Characters are,

It hath male and hermaphrodite Flowers in distinct Plants. The male Flowers have Pitcher-shaped Empalements of one Leaf, which are permanent, and cut at the Top into five Segments. The Flowers have 5 oblong Petals connected at their Base, but spread open and divided at Top; they have many hair, Stamina, joined at the Bottom into a Sort of cylindrical Column, terminated by roundish compressed Summits. The hermaphrodite Flowers have the like Empalement, Petals, and Stamina, as the male, with a conical Germen, supporting a cylindrical Style, divided at Top into 10 Parts, crowned by single Stigmas. The Germen turns to an oval fruit, inclosed in the Empalement, divided into 10 Cells, each containing one Kidney-shaped Seed.

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The Species are

1. NAPÆA foliis palmatis scabris acutè dentatis, pedunculis racemosis. Napæa with rough Hand-shaped Leaves, which are acutely indented, and branching Foot Stalks to the Flowers. This is the *Abutilon folio profunde dissecto*, pedunculis multifloris mas & fœmina. Ebrēt. Piēt. 7. & 8. *Abutilon* with a deeply divided Leaf, and Foot Stalks having many Flowers, which are both male and female.

2. NAPÆA foliis trilobatis, lobis acuminatis inæqualiter serratis, pedunculis nudis trifloris. Napæa with Leaves having three acute-pointed Lobes, which are unequally sawed, and naked Foot Stalks with three Flowers. This is the *Althæa Ricini folio Virginiana*. H. L. *Virginia* Marshmallow with a *Ricinus* Leaf.

The 1st Sort has perennial Roots, which are composed of many thick fleshy Fibres, which strike deep into the Ground, and are connected at Top into a large Head, from which come out a great Number of Hand-shaped

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Leaves,

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Leaves, near a Foot Diameter each Way; they are rough, hairy, and are deeply cut into 6 or 7 Lobes, irregularly indented on their Edges, each Lobe having a strong Mid-rib, which all meet in a Center at the Foot Stalk. The Foot Stalks are large and long, arising immediately from the Root, and spread out on every Side. The Stalks rise 7 or 8 Feet high, and divide into smaller Branches; they are hairy, and garnished at each Joint with one Leaf, of the same Form as those below, but diminish in their Size toward the Top, where they seldom have more than three Lobes, which are divided to the Foot Stalk; toward the upper Part of the Stalk, comes out from the Side at each Joint, a long Foot Stalk, which branches out toward the Top, sustaining several white Flowers, which are tubulous at Bottom, where the Segments of the Petal are connected, but they spread open above, and are divided into five obtuse Segments; in the Center arises the Column, to which the Stamina are joined at their Base, but spread open above, and in the hermaphrodite Flowers the Style is connected to the same Column. The hermaphrodite Flowers are succeeded by compressed orbicular Fruit, inclosed in the Empalement, and divided into five Cells, each containing a Kidney-shaped Seed, but the male Plants are barren. It flowers in July, and the Seeds ripen in Autumn, soon after which the Stalks decay, but the Roots will live many Years.

The 2d Sort hath also a perennial Root, which frequently creeps in the Ground; this sends up smooth Stalks, which rise about 4 Feet high, and are garnished with smooth Leaves, placed alternately, standing on pretty long slender Foot Stalks; they are deeply cut into three Lobes, which end in acute Points, and are irregularly sawed on their Edges; those on the lower Part of Stalk, are near 4 Inches long, and near as much in Breadth, but they diminish gradually toward the Top of the Stalk. At the Base of the Leaf comes out the Foot Stalk of the Flower, which is about 3 Inches long, dividing at the Top into 3 smaller, each sustaining one white Flower of the same Form with those of the first Sort, but smaller, and the Column of Stamina is longer, their Summits standing out beyond the Petal; these Plants have male and hermaphrodite Flowers on distinct Plants, as the former Sort; Dr. *Linnaeus* has supposed the Plants were all with hermaphrodite Flowers, but I have many Years had the male Plants in the Chelsea Garden.

Both Sorts grow naturally in *Virginia*, and other Parts of *North America*; from the Bark of these Plants a Sort of Hemp, might be procured, which many of the malvaceous Tribe afford; and in some of the Sorts which grow naturally in *India*, the Fibres of the Bark are so fine, as to spin into very fine Threads, of which there might be woven very fine Cloth.

They are easily propagated by Seeds, which if sown on a Bed of common Earth in Spring, the Plants will rise very freely, and require no Care but to keep them clear from Weeds till Autumn, when they may be transplanted into the Places where they are to remain; they delight in a rich moist Soil, in which they will grow very luxuriantly, so they must be allowed Room. The 2d Sort may be propagated by its creeping Roots, which may be parted in Autumn; but as these Plants have no great Beauty,

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so one or two of each Sort in a Garden, for Variety, will be enough.

NARCISSO LEUCOIUM. See Galanthus.

NARCISSUS. *Tourn. Infl. R. H.* 353. *Tab.* 185. *Lin. Gen. Plant.* 364. [takes its Name of *Nάρκωσις*, or *Nάρκη*, a Torpidness, or deep Sleep, because the Smell of this Flower is said to cause a Heaviness of the Head, and a Stupidity.] The Daffodil.

The Characters are,

The Flowers are included in an oblong compressed Spatha (or Sheath) which opens on the Side, and withers. The Flowers have a cylindrical Funnel-shaped Empalement of one Leaf, which is spread open at the Brim; they have 6 oval Petals on the Outside of the Nectarium, which are inserted above their Base, and 6 Awl-shaped Stamina fixed to the Tube of the Nectarium, terminated by oblong Summits; they have a three-cornered, roundish, obtuse Germen, situated below the Flower, supporting a long slender Style, crowned by a trifid Stigma. The Germen afterward turns to an obtuse, roundish, three-cornered Capsule, with 3 Cells, filled with globular Seeds.

The Species are,

1. NARCISSUS *spatha uniflora, nectarii limbo campanulato erecto, petalo aquale.* *Lin. Sp. Plant.* Daffodil with one Flower in each Sheath, whose Nectarium is erect, Bell-shaped, and equal with the Petals. This is the *Narcissus sylvestris pallidus, calyce luteo.* *C. B. P.* 52. Pale wild Daffodil with a yellow Cup, or common English Daffodil.

2. NARCISSUS *spatha uniflora, nectarii limbo rotato brevissimo.* *Hort. Up.* 74. Daffodil with one Flower in a Sheath, and a very short Wheel-shaped Nectarium. This is the *Narcissus albus, circulo purpureo.* *C. B. P.* 48. White Daffodil with a purple Circle in the Middle.

3. NARCISSUS *spatha uniflora, nectarii limbo campanulato erecto, petalo dimidius brevior.* Daffodil with one Flower in a Sheath, and an erect Bell-shaped Empalement, half the Length of the Petal. This is the *Narcissus incomparabilis, flore pleno, partim flavo, partim croceo.* *H. R. Par.* Incomparable Daffodil with a double Flower, partly yellow, and partly Saffron-coloured.

4. NARCISSUS *spatha biflora, nectario campanulato brevissimo, floribus nutantibus.* Daffodil with two Flowers in a Sheath, a short Bell-shaped Nectarium, and nodding Flowers. *Narcissus medio luteus vulgaris.* *Park.* Common Daffodil with a yellow Middle, called Primrose Peerless.

5. NARCISSUS *spatha uniflora, nectario campanulato brevissimo, petalis reflexis.* Daffodil with one Flower in a Sheath, a very short Bell-shaped Nectarium, and reflexed Petals. This is the *Narcissus albus, foliis reflexis, calyce brevi aures.* *H. R. Par.* Daffodil with white Flowers, reflexed Petals, and a short golden Cup.

6. NARCISSUS *spatha uniflora, nectario turbinato maximo, genitalibus declinatis.* *Lin. Sp. P.* 289. Daffodil with one Flower in a Sheath, a very large turbinated Nectarium, and declined Stamina. This is the *Pseudonarcissus juncifolius 2 flavo flore.* *Clus. Hist.* 166. Second Rush-leaved Bastard Daffodil with a yellow Flower, commonly called, The Hoop Petticoat *Narcissus*.

7. NARCISSUS *spatha uniflora, nectario brevissimo, sexpartito.* *Lin. Sp. Plant.* 290. Daffodil with one Flower in a Sheath, having a very short Nectarium cut into six Parts.

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Parts. This is the *Narcissus autumnalis minor*. *Clus. Hisp.* 251. Smaller autumnal Daffodil.

8. *NARCISSUS spatbâ multiflorâ, nectario campanulato, foliis planis Hort. Upsal.* 74. Daffodil with many Flowers in a Sheath, a Bell-shaped Nectarium, and plain Leaves. This is the *Narcissus luteus polyanthos Lusitanicus*. *C. B. P.* 50. Yellow *Portugal* Daffodil with many Flowers, commonly called, *Polyanthus Narcissus*.

9. *NARCISSUS spatbâ multiflorâ, nectario campanulato brevi, foliis subulatis. Hort. Upsal.* 75. Daffodil with many Flowers in a Sheath, a short Bell-shaped Nectarium, and Awl-shaped Leaves. This is the *Narcissus juncifolius luteus minor*. *C. B. P.* 51. Smaller yellow Rush-leaved Daffodil, called Jonquil.

The Sorts here enumerated, are all the real Species which I have met with in the *English* Gardens, though there is a great Variety of each Species, which differ so much from one another, as to render it very difficult to ascertain the Species to which they belong; in order to find out, as well as I could, from what Species many of those Varieties have been raised, I endeavoured to degenerate as many of the double flowering, and others of the best Kinds, so far as I could, by which I have observed their several Changes, and shall here mention, under each Species, the Varieties I have observed.

The 1st Sort is the common *English* Daffodil, which grows naturally by the Borders of Woods, and Fields in many Parts of *England*; this hath a large bulbous Root, from which come out 5 or 6 flat Leaves about a Foot long, and an Inch broad, of a grayish Colour, and a little hollowed in the Middle, like the Keel of a Boat. The Stalk rises a Foot and a Half high, having two sharp longitudinal Angles; at the Top comes out a single Flower, inclosed in a thin Spatha (or Sheath,) which is torn open on one Side, to make way for the Flower to come out, and then withers and remains on the Top of the Stalk. The Flower is of one Petal, or Leaf, being connected at the Base, but is cut into 6 Parts almost to the Bottom, which expand; in the Middle of this is situated a Bell-shaped Nectarium, called by Gardeners a Cup, which is equal in Length to the Petal, and stands erect. The Flower nods on one Side the Stalk. The Petal is of a pale Brimstone Colour, and the Nectarium yellow. It flowers the Beginning of *April*, and after the Flowers are past, the Germen turns to a roundish Capsule, with 3 Cells filled with roundish black Seeds, which ripen in *July*. This Sort propagates very fast by Offsets from the Root.

The Varieties of this are,

One with white Petals, and a pale yellow Cup.

One with yellow Petals, and a golden Cup.

The common double yellow Daffodil.

Another double Daffodil with three or four Cups within each other.

And I believe, *John Tradescant's* Daffodil, may be referred to this Species.

The 2d Sort grows naturally in the South of *France*, and in *Italy*; this has a smaller and rounder bulbous Root than the former. The Leaves are longer, narrower, and flatter than those of that Sort. The Stalks do not rise higher than the Leaves, which are of a gray Colour; at the Top of the Stalk comes out one Flower from the Sheath, which nods on one Side. The Petal of

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this is cut into six Segments, which are rounded at their Points; they are of a Snow white, and spread open flat. In the Center is situated a very short Nectarium, or Cup, which is fringed on the Border with a bright purple Circle. The Flowers have an agreeable Odour. This flower in *May*, but seldom produces Seeds, however it encreases fast enough by Offsets.

The double white *Narcissus* is the only Variety of this which I have observed, though there are mentioned in some Books several other.

The 3d Sort grows naturally in *Spain* and *Portugal*, from whence I received the Roots. The Bulbs of this Sort are very like those of the first. The Leaves are longer, of a darker green, and the Flower Stalks rise higher. The Segments of the Petal are rounder, and spread open, flatter than those of the first Sort. The Nectarium, or Cup, in the Middle is about half the Length of the Petal, and is edged with a Gold-coloured Fringe. It flowers in *April*, but seldom produces Seeds here. This Sort sports and varies more than any of the other: The following Variations I have traced in the same Roots.

The Roots of these, the first Year, produced very double Flowers, of the Sort commonly called the Incomparable Daffodil. The six outer Segments of the Petal were longer than either of the others, and white; the Middle was very full of shorter Petals, some of which were white, others yellow, and collected into a globular Figure: Some of these Roots, the following Year, produced Flowers less double than before, with no white Petals, but the larger Petals were of a Sulphur Colour, and the others yellow; from this they afterward degenerated to half double Flowers, and at last to single Flowers, with a Cup half the Length of the Petal, in which Manner they have continued to flower many Years; so we may conclude, that those Varieties were first obtained from the Seeds of this single Flower.

The 4th Sort grows naturally in the South of *France* and in *Italy*, and has been found growing in the Fields in some Parts of *England*, probably from some Roots which have been thrown out of Gardens with Rubbish. The Roots of this Sort are not so large as those of the first, and are rounder; the Leaves are long, of a gray Colour, and smoother than those of the first; the Flower Stalks are of the same Length with the Leaves, and have commonly but one Flower in a Sheath, but sometimes when the Roots are strong, they have two. The Flower nods downward, the Segments of the Petal are a little waved on their Edges, the Nectarium or Cup is short, and bordered with yellow: It flowers in *May*, but as the Scent is not very agreeable, nor they very beautiful, so they are seldom cultivated in Gardens, since finer Sorts have been plenty. I believe there is no Variety of this, for I could never observe any Variation in their Flowers.

The 5th Sort has some Resemblance of the 4th; but the Flowers are whiter; the Segments of the Petal are reflexed, and the Border of the Nectarium or Cup, of a Golden yellow: this has some affinity to the 2d Sort.

The 6th Sort grows naturally in *Portugal*, from whence I received the Roots. The Bulbs of this are small, the Leaves very narrow, having some Resemblance to those of the Rush, but are a little compressed, and have a longitudinal Furrow on one Side; these are seldom

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dom more than 8 or 9 Inches long. The Flower Stalk is slender, taper, and about six Inches long, sustaining at the Top one Flower, which is at first inclosed in a Sheath; the Petal is scarce half an Inch long, and is cut into six acute Segments; the Nectarium or Cup is more than two Inches long, very broad at the Brim, lessening gradually to the Base, being somewhat formed like the Ladys Hoop Petticoats, from whence the Flower is so called. It flowers in *April*, but does not produce Seeds here. There are no Varieties of this Sort.

The 7th Sort grows naturally in *Spain*; this hath a small bulbous Root; the Leaves are but few in Number, and narrow; the Stalk is Jointed, and rises about 9 Inches, sustaining at the Top one Flower, which at first is inclosed in the Sheath; the Flower is white and cut into six narrow Segments; the Nectarium (or Cup) is yellow. It flowers late in Autumn, and the Roots are tender, so are often killed by hard Frosts in *England*, which renders it scarce here.

The 8th Sort grows naturally in *Portugal*, and in the Islands of the *Archipelago*; of this there is a greater Variety than of all the other Species, for as the Flowers are very ornamental, and come early in the Spring, the Florists in *Holland*, *Flanders*, and *France*, have taken great Pains in cultivating and improving them; so that at present the Catalogues printed by the *Dutch* Florists, contain more than four score Varieties, the principal of which are these hereafter mentioned.

These have yellow Petals, with Orange, yellow, or Sulphur coloured Cups, or Nectariums.

The Great <i>Algiers</i> .	The Most Beautiful.
The Ladies <i>Noségay</i> .	The Golden Star.
The Greater Bell.	The Mignon.
The Golden Royal.	The Zeylander.
The Golden Scepter.	The Madoufe.
The Triumphant.	The Golden Sun.

The following have white Petals, with yellow or Sulphur coloured Cups or Nectariums.

The Grand Duke.	The Greater Bozelman.
The Triumphant <i>Noségay</i> .	The Czarina.
The New <i>Dorothy</i> .	The Grand Monarque.
The Passe Bozelman.	The Czar of Muscovy.
The Superb.	The Surpassante.

There are some with white Petals and white Cups, but these are not so much esteemed as the others, though there are 2 or 3 Varieties with large Bunches of small white Flowers, which have a very agreeable Odour, so are as valuable, and are later in flower than most of the other Sorts. There is also one with very double Flowers, whose outer Petals are white, and those in the Middle are some white and others of an Orange Colour, which have a very agreeable Scent, and is the earliest in flowering; it is generally called the *Cyprus Narcissus*, and seems to be a distinct Species from the others. This, like most other double Flowers, never produces any Seeds, so is only propagated by Offsets, and is the most beautiful of all the *Narcissus*, when blown on Glasses of Water in a Room; but when it is planted in the Ground, if the Bed is not covered with Mats in frosty Weather, to prevent their flower Buds from being destroyed, they seldom flower; for the Leaves begin to shoot early in the Autumn, and the Flower Buds appear about *Christmas*, which are tender, so that if hard

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Frost happens when they are coming out of the Ground, it generally kills them; but if they are properly screened from Frost, they will flower in *February*, and in mild Seasons often in *January*.

The 9th Sort is the Jonquil, a Flower so well known as to need no Description; of this there is the great and small Jonquil with single and double Flowers, and the common Sort with double Flowers, which is most esteemed.

I shall first treat of the Method for raising the fine Sorts of *Polyanthus Narcissus* from Seeds, which is the Way to obtain new Varieties.

The not practising this has occasioned our sending Abroad annually for great Quantities of Flower Roots, which have been kept up to a high Price, on Account of the great Demand for them in *England*; whereas if we were as industrious to propagate them as our Neighbours, we might soon vie with them, if not outdo them, in most Sorts of Flowers; as may be seen, by the vast Variety of Carnations, Auriculas, Ranunculas, &c. which have been produced from Seeds in *England*, and exceed most of those Kinds in any Part of *Europe*.

You must be very careful in saving your Seeds, to gather none but from such Flowers as have good Properties, and particularly from such only as have many Flowers on a Stalk, that flower tall, and have beautiful Cups to their Flowers, from such you may expect to have good Flowers produced; but if you sow ordinary Seed, it is only putting yourself to Trouble and Expence to no Purpose, since from such Seeds there can be no Hopes of procuring any valuable Flowers.

Having provided yourself with good Seeds, procure some shallow Cases or flat Pans, made on Purpose for raising Seedlings, which should have Holes in their Bottoms, to let the Moisture pass off; these must be filled with fresh light sandy Earth about the Beginning of *August* (this being the Season for sowing the Seeds of most bulbous rooted Flowers); the Earth in these must be leveled very even; then sow the Seeds pretty thick, covering them over with fine sifted light Earth about half an Inch thick, and place the Cases or Pans in a Situation where they may have only the Morning Sun till about ten o'Clock, where they should remain until the Beginning of *October*, when they must be removed into a warmer Situation, placing them upon Bricks, that the Air may freely pass under the Cases, which will preserve them from being too moist.

They should also be exposed to the full Sun, but screened from the North and East Winds; and if the Frost should be severe they must be covered, otherwise they will be in Danger of being destroyed; in this Situation they may remain until the Beginning of *April*, by which Time the Plants will be up, when you must carefully clear them from Weeds; and if the Season proves dry, they must be frequently watered: The Cases should now be removed into a shady Position, or shaded in the Middle of the Day, for the Heat of the Noon Day Sun will be too great for the young Plants.

The latter End of *June*, when the Leaves are decayed, take off the upper Surface of the Earth in the Cases (which by that Time will have contracted a Mossiness, and, if suffered to remain, will greatly injure the young Roots, observing not to take it so deep as to touch the

Roots;

Roots; then sift some fresh light Earth over the Surface, about half an Inch thick, which will greatly strengthen the Roots; the same should be repeated in *October*, when the Cases are moved again into the Sun.

During the Summer Season, if the Weather should prove very wet, and the Earth in the Case appear very moist, you must remove them into the Sun till the Earth be dry again; for if the Roots receive much Wet, during the Time they are unactive, it very often rots them; therefore you must never give them any Water after their Leaves are decayed, but only place them in the Shade, as before directed.

Thus you should manage them the two first Seasons, till their Leaves are decayed the second Summer after sowing, then carefully take up the Roots; which may be done by sifting the Earth in the Cases through a fine Sieve, whereby the Roots will be easily separated from the Earth; then having prepared a Bed or two of good fresh light Earth, in Proportion to the Quantity of Roots, plant them therein, at about three Inches Distance every Way, and 3 Inches deep in the Ground.

These Beds should be raised above the Level of the Ground, in Proportion to the Moisture of the Soil, which if dry, three Inches will be enough; but if it be wet, they must be raised six or eight Inches high, and laid a little rounding, to shoot off the Wet.

If these Beds are made in *July*, which is the best Time to transplant the Roots, the Weeds will soon appear very thick; therefore you should gently hoe the Surface of the Ground to destroy them, being very careful not to cut so deep as to touch any of the Roots, and this should be repeated as often as may be found necessary, by the Growth of Weeds, observing always to do it in dry Weather, that they may be effectually destroyed; toward the latter End of *October*, after having entirely cleared the Beds from Weeds, you should sift a little rich light Earth over them, about an Inch thick; the Goodness of which will be washed down to the Roots by the Winter's Rain, which will greatly encourage their shooting in the Spring.

If the Cold should be very severe in Winter, you should cover the Beds, either with old Tan or Sea Coal Ashes, or in want of these with Peas Haulm, or some such light Covering, to prevent the Frost from penetrating the Ground to the Roots, which might greatly injure them while they are so young.

In the Spring, when the Plants begin to appear above Ground, you must gently stir the Surface, to clear it from Weeds, &c. in doing of which be very careful not to injure the Plants; and if the Season proves dry, you should now and then gently refresh them with Water, which will strengthen the Roots.

When their Leaves are decayed, clear the Beds from Weeds, and sift a little Earth over them (as before directed) which must also be repeated in *October*; but the Roots should not remain longer in these Beds than two Years, by which Time they will have grown so large as to require more Room; therefore they should be taken up as soon as their Leaves are decayed, and planted in fresh Beds; which should be dug deep, and a little very rotten Dung buried in the Bottom, for the Fibres of the Roots to strike into. Then the Roots should be planted at six Inches Distance, and the same Depth in

the Ground. In Autumn, before the Frost comes on, if some rotten Tan is laid over the Beds, it will keep out the Frost, and greatly encourage the Roots; and if the Winter should prove severe, it will be proper to lay a greater Thickness of Tan over the Beds, and also in the Alleys, to keep out Frost, or to cover them over with Straw or Peas Haulm, otherwise they may be all destroyed by the Cold. In Spring these Coverings should be removed as soon as the Danger of hard Frosts is over, and the Beds must be kept clean from Weeds the following Summer: At *Michaelmas* they should have some fresh Earth laid over the Beds, and covered again with Tan; and so every Year continued till the Roots flower, which is generally in five Years, from Seed, when you should mark all such as promise well, which should be taken up as soon as their Leaves decay, and planted at a greater Distance in new prepared Beds; but those which do not flower, or those you do not greatly esteem, should be permitted to remain in the same Bed; therefore, in taking up those Roots which you marked, you must be careful not to disturb the Roots of those left, and also to level the Earth again, and sift some fresh Earth over the Beds (as before) to encourage the Roots; for it often happens that the Seedlings of these Flowers, at their first Time of blowing, seldom appear half so beautiful as they do the second Year; for which Reason none of them should be rejected until they have flowered two or three Times, that so you may be assured of their Worth.

Thus having laid down Directions for the sowing and managing these Roots, until they are strong enough to flower, I shall proceed to give some Instructions for planting and managing the Roots afterwards, so as to cause them to produce large fair Flowers.

All the Sorts of *Narcissus* which produce many Flowers upon a Stalk, should have a Situation defended from cold and strong Winds, otherwise they will be subject to be injured by the Cold in Winter, and their Stems broken down when in flower; for notwithstanding their Stalks are generally pretty strong, yet the Number of Flowers upon each renders their Heads weighty, especially after Rain, which lodges in the Flowers, and, if succeeded by strong Winds, very often destroys their Beauty, if they are exposed thereto; so that a Border under a Hedge, which is open to the South East, is preferable to any other Position for these Flowers.

The Morning Sun rising upon them will dry off the Moisture which had lodged on them the preceding Night, and cause them to expand fairer than when they are planted in a shady Situation; and if they are too much exposed to the Afternoon Sun, they will be hurried out of their Beauty very soon; and the strong Winds usually coming from the West and South-west Points, they will be exposed to the Fury of them, which frequently is very injurious to them.

Having made Choice of a proper Situation, you must then proceed to prepare the Earth necessary to plant them in; for if the natural Soil of the Place be very strong or poor, it will be proper to make the Border of new Earth, removing the former Soil away about three Feet deep. The best Earth for these Flowers is a fresh light hazel Loam, mixed with a little very rotten Neas Dung; This should be well mixed together, and often turned over, in order to sweeten it; then having removed

moved away the old Earth to the fore-mentioned Depth, you should put a Laying of rotten Dung or Tan in the Bottom, about 4 or 5 Inches thick, upon which you must lay some of the prepared Earth about 18 or 20 Inches thick, making it exactly level; then having marked out by Line the exact Distances at which the Roots are to be planted (which should not be less than 6 or 8 Inches square,) place the Roots accordingly, observing to set them upright; then you must cover them over with the before-mentioned Earth about 8 Inches deep, being very very careful in doing it, not to displace the Roots; when this is done, make the Surface of the Border even, and the Side strait, which will appear handsome.

The best Time for planting these Roots is in *August*, for if they are kept too long out of the Ground, it will cause their Flowers to be very weak. You should also observe the Nature of the Soil where they are planted, and whether the Situation be wet or dry, according to which you should adapt the fresh Earth, and order the Beds; for if the Soil be very strong, and the Situation moist, you should then make Choice of a light Earth, and raise the Beds 6 or 8 Inches, or a Foot, above the Level of the Ground, otherwise the Roots will be in Danger of perishing by too much Wet; but if the Situation be dry and the Soil naturally light, you should then allow the Earth to be a little stronger, and the Beds should not be raised above 3 Inches high; for if they are made too high, the Roots will suffer very much, if the Spring should prove dry, nor would the Flowers be near so fair; also in very severe Winters, those Beds which are raised much above the Level of the Ground, will be more exposed to Cold than those which are lower, unless the Alleys are filled up with rotten Tan or Litter.

During the Summer, the only Culture these Flowers require is, to keep them free from Weeds; and when their Leaves are entirely decayed, they should be raked off, and the Beds made clean; but by no Means cut off their Leaves till they are quite decayed, as is by some practised, for that greatly weakens the Roots.

Towards the Middle of *October*, if the Weeds have grown upon the Beds, gently hoe the Surface of the Ground, in a dry Day, to destroy them, observing to rake it over smooth again; and before the Frosts come on, the Beds should be covered two Inches thick with rotten Tan, to keep out the Frost; after which they will require no farther Care till Spring, when their Leaves will appear above Ground; at which Time you should gently stir the Surface of the Earth with a small Trowel, being very careful not to injure the Leaves of the Plants, and rake it smooth with your Hands clearing off all Weeds, &c. which, if suffered to remain at that Season, will soon grow so fast, as to appear unsightly, and exhaust the Nourishment from the Earth. With this Management these Roots will flower very strong, some of which will appear in *March*, and others in *April*, which if suffered to remain, will continue in Beauty a full Month, and are, at that Season, very great Ornaments to a Flower Garden.

After the Flowers are past and the Leaves decayed, you should stir the Surface of the Ground, to prevent the Weeds from growing; and if at the same Time you lay a little very rotten Dung over the Surface of the

Beds, the Rain will wash down the Salts thereof, which will greatly encourage the Roots the succeeding Year.

During Summer they require no farther Care, but to keep them clear from Weeds till *October*, when the Surface of the Beds should be again stirred, raking off all Weeds, &c. and laying some good fresh Earth over the Beds about an Inch deep, which will make good the Loss sustained by Weeding, &c. and in Spring, manage as directed for the preceding Year.

These Roots should not be transplanted oftener than every third Year; because the first Year after removing, they never flower so strong as they do the second and third; nor will the Roots increase so fast, when they are often transplanted; but if you let them remain longer than three Years unremoved, the Number of Offsets which by that Time will be produced, will weaken the large Bulbs, and cause them to produce very weak Flowers; therefore, at the Time of transplanting, all the small Offsets should be taken off, and planted in a Nursery Bed by themselves, but the large Bulbs may be planted again for flowering. If you plant them in the same Bed where they grew before, you must take out all the Earth two Feet deep, and fill it up again with fresh, in the Manner before directed, which will be equal to removing them into another Place: This is the constant Practice of the Gardeners in *Holland*, who have but little Room to change their Roots; therefore they every Year remove the Earth of their Beds and put in fresh, so that the same Place is constantly occupied by the like Flowers: But they take up their Roots every Year, for as they cultivate them for Sale, the rounder their Roots are, the more valuable they will be: The Way to have them so is, to take their Offsets from them annually; for when the Roots are left two or three Years unremoved, the Offsets will have grown large, and these pressing against each other, cause their Sides to be flatted; therefore the Roots propagated for Sale, should be annually taken up as soon as their Leaves decay; and the large Bulbs may be kept out of the Ground till the Middle or End of *October*, but the Offsets should be planted the Beginning of *September* or sooner, that they may get Strength, so as to become blowing Roots the following Year: But where they are designed for Ornament, they should not be removed oftener than every third Year, for then the Roots will be in large Bunches, and a Number of Stalks with Flowers coming from each Bunch, which will make a much better Appearance than where a single Stalk rises from each Root, which will be the Case when the Roots are annually removed.

The common Sorts of Daffodil are generally planted in large Borders of the Pleasure Garden, where being intermixed with other bulbous rooted Flowers, they afford an agreeable Variety in their Seasons of flowering. These Roots are very hardy, and thrive in almost any Soil or Situation, which renders them very proper for rural Gardens, where, being planted under the Shade of Trees, they will thrive for several Years without transplanting, and produce annually in the Spring, great Quantities of Flowers, which make a good Appearance before the Trees come out in Leaf.

The Jonquils should be planted in Beds or Borders, separate from other Roots, because they require to be transplanted

transplanted at least every other Year, otherwise their Roots are apt to grow long and slender, and seldom flower well after; which is also the Case, if they are continued many Years in the same Soil; wherefore the Roots should be often removed from one Part of the Garden to another, or at least, the Earth should be often renewed, which is the most probable Method to preserve these Flowers in Perfection.

The Soil in which they succeed best, is an hazel Loam, neither too light nor over stiff; it must be fresh, and free from Roots of Trees or noxious Weeds, but should not be dunged; for it is very remarkable, that where the Ground is made rich, they seldom continue good very long, but are subject to shoot downwards, and form long slender Roots.

These Flowers are greatly esteemed by many People for their strong sweet Scent, though some Ladies cannot bear the Smell of them; so powerful is it, that many Times it overcomes their Spirits, especially if confined in a Room; for which Reason, they should never be planted too close to a Habitation, nor should the Flowers be placed in Rooms where Company is entertained.

NASTURTIIUM. *Tourn. Inst. R. H. Lepidium. Lin. Gen. 718.* Cress; in French, *Cresson*.

The Characters are,

The Flower hath a four leaved Empalement. It has 4 Petals placed like a Cross, and 6 Awl-shaped Stamina, four of which are the same Length of the Empalement, and two are shorter, terminated by single Summits. In the Center is situated a Heart-shaped Germen, supporting one Style crowned by an obtuse Stigma. The Germen turns to a Heart-shaped short Capsule, with acute Borders having two Cells, each containing one or two oval Seeds.

The Species are,

1. **NASTURTIIUM foliis oblongis multifidis, caule erecto.** Cress with oblong Leaves ending in many Points, and an erect Stalk. This is the *Nasturtium hortense vulgatum*. C. B. P. 103. Common Garden Cress.

2. **NASTURTIIUM foliis radicalibus incis, caulibus oblongis integerrimis, caule erecto ramoso.** Cress with lower Leaves divided, but those on the Stalks oblong and entire, and an erect branching Stalk. *Nasturtium hortense latifolium*. C. B. P. Broad-leaved Garden Cress.

3. **NASTURTIIUM foliis pinnatifidis, caulibus procumbentibus.** Cress with Leaves ending in many Points, and trailing Stalks. This is the *Coronopus ruellii* sive *Nasturtium verrucosum*. J. B. 2. 919. Swines Cress.

There are some other Species of this Genus, but they are seldom cultivated in Gardens.

The common Cress is a Plant so well known, as to need no Description; there is a Variety of this, whose lower Leaves are much curled on their Edges; this was formerly cultivated in greater Plenty than at present.

The broad leaved Sort, I think, is a distinct Species; the lower Leaves are very broad, and cut into 3 or 5 Lobes. The Stalks rise higher, branch out more than the common Sort, and the Branches grow more upright; this was formerly more cultivated than at present.

The 1st Sort is commonly cultivated in Gardens as a Salad Herb, and is chiefly esteemed in Winter and Spring, being one of the warm Kind. During the Winter Season, it must be sown on a gentle hot Bed, and covered with either Mats or Glasses to preserve it from

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great Rains or Frost, both which are equally destructive at that Season: In Spring it may be sown in warm Borders, where, if it be defended from cold Winds, it will thrive very well; but if you would continue it in Summer, you must sow it upon shady Borders, and repeat sowing every third Day, otherwise it will be too large for Use, for at that Season it grows very fast.

The curled Sort is preserved in some Gardens for Curiosity, and to garnish Dishes, but the common Sort is equally good for Use. This should be sown thinner than the common Sort, and when the Plants come up, they should be drawn out, so as to leave the remaining ones half an Inch asunder, whereby they will have Room to expand their Leaves.

In order to preserve the Variety with curled Leaves distinct, you must carefully separate all such Plants as appear inclined to degenerate from their Kind, leaving only such as have their Leaves very much curled. When the Seeds are ripe the Plants should be drawn up, and spread upon a Cloth two or three Days to dry, after which the Seeds should be beaten out, and preserved in a dry Place for Use.

NASTURTIIUM INDICUM. See *Tropæolum*.

NECTARINE [so called of *Nectar*, the poetical Drink of the Gods], *Nectarine*.

This Fruit should have been placed under the Article of *Peaches*, to which it properly belongs, differing from them in nothing more than in having a smooth Rind, and the Flesh being firmer. These the French distinguish by the Name of *Brugnon*, as they do those *Peaches* which adhere to the Stone, by the Name of *Pavies*, retaining the Name of *Pêche* to such only as part from the Stone; but since the Writers in Gardening have distinguished this Fruit by the Name of *Nectarine* from the *Peaches*, I shall follow their Example, lest by endeavouring to rectify their Mistakes, I should render myself less intelligible to the Reader. I shall therefore mention the several Varieties of this Fruit, which have come to my Knowledge:

1. *Fairchild's Early Nectarine*; is one of the earliest ripe Nectarines we have; it is a small round Fruit, about the Size of the Nutmeg Peach, of a beautiful red Colour, and well flavoured; it ripens the End of July.

2. *Elruge Nectarine*: The Tree has sawed Leaves; the Flowers are small; it is a middle sized Fruit, of a dark red or purple next the Sun, but of a pale yellow or greenish Colour towards the Wall; it parts from the Stone, and has a soft melting Juice: This ripens in the Beginning of August.

3. *Newington Nectarine*: The Tree has sawed Leaves; the Flowers are large and open; it is a fair large Fruit (when planted on a good Soil), of a beautiful red Colour next the Sun, but of a bright yellow towards the Wall; it has an excellent rich Juice; the Pulp adheres closely to the Stone, where it is of a deep red Colour: This ripens the latter End of August, and is the best flavoured of all the Sorts.

4. *Scarlet Nectarine* is somewhat less than the last, of a fine red or scarlet next the Sun, but loses itself in paler red towards the Wall: This ripens the End of August.

5. *Brugnon or Italian Nectarine* has smooth Leaves; the Flowers are small; it is a fair large Fruit, of a deep red Colour next the Sun, but a soft yellow towards the

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Wall; the Pulp is firm, of a rich Flavour, and closely adheres to the Stone, where it is very red: This ripens the End of *August*.

6. *Roman Red Nectarine* has smooth Leaves, and large Flowers; it is a large fair Fruit, of a deep red or purple Colour towards the Sun, but has a yellowish Cast next the Wall; the Flesh is firm, of an excellent Flavour, closely adhering to the Stone where it is very red: This ripens the End of *August*.

7. *Murphy Nectarine* is a middle sized Fruit, of a dirty red Colour on the Side next the Sun, but of a yellowish green towards the Wall, the Pulp is tolerably well flavoured: This ripens the Beginning of *September*.

8. *Golden Nectarine* is a fair handsome Fruit, of a soft red Colour next the Sun, but a bright yellow next the Wall; the Pulp is very yellow, of a rich Flavour, and closely adheres to the Stone, where it is of a faint red Colour: This ripens the Middle of *September*.

9. *Temple's Nectarine* is a middle sized Fruit, of a soft red next the Sun, but a yellowish green toward the Wall; the Pulp is melting, of a white Colour towards the Stone, from which it parts, and has a fine poignant Flavour; this ripens the End of *September*.

10. *Peterborough*, or late green Nectarine, is a middle sized Fruit, of a pale green Colour on the Outside next the Sun, but a whitish green towards the Wall; the Flesh is firm, and, in a good Season, well flavoured; this ripens the Middle of *October*.

There are some Persons who pretend to have more Sorts than I have here set down, but I much doubt whether they are different from those here mentioned, there being so near a Resemblance between the Fruits of this Kind, that it requires a very close Attention to distinguish them well, especially if the Trees grow in different Soils and Aspects, which many Times alters the same Fruit so much, as hardly to be distinguished by Persons who are very conversant with them; therefore, in order to be thoroughly acquainted with their Differences, it is necessary to consider the Shape and Size of their Leaves, the Size of their Flowers, their Manner of Shooting, &c. which is many Times very helpful in knowing these Fruits.

The Culture of this Fruit differing in nothing from that of the Peach, I shall forbear mentioning any Thing on that Head in this Place, to avoid Repetition, but refer the Reader to the Article *Persica*, where there is an ample Account of their Planting, Pruning, &c.

NEPETA. *Lin. Gen. Plant.* 629. *Cataria*. *Tourn. Inst.* Catmint, or Nep; in *French*, *Herbe aux Chats*.

The Characters are,

The Empalement is tubulous and cylindrical, indented into 5 acute Parts at Top. The Flower is of the Lip Kind, with one Petal, having an incurved cylindrical Tube, gaping at the Top. The upper Lip is erect, roundish, and indented at the Point. The under is large, concave, entire, and sawed on the Edge. It hath 4 Awl-shaped Stamina, situated under the upper Lip, 2 of which are shorter than the other, terminated by incumbent Summits. In the Bottom of the Tube is situated the quadrifid Germen, supporting a slender Style, crowned by a bifid acute Stigma. The Germen turns to 4 oval Seeds, sitting in the Empalement.

The Species are,

1. *NEPETA floribus spicatis, verticillis subpedicellatis, foliis petiolatis cordatis dentato-serratis*. *Lin. Sp. Plant.*

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570. Catmint with spiked Flowers, whose Whorls have very short Foot Stalks, and Heart-shaped Leaves growing on Foot Stalks, which are indented like the Teeth of a Saw. This is the *Cataria major vulgaris*. *Tourn. Inst. R. H.* 202. Common greater Catmint.

2. *NEPETA floribus spicatis, spicis interruptis, verticillis pedicellatis, foliis subcordatis serratis petiolatis*. Catmint with Spikes of Flowers, which are interrupted, Whorls standing on Foot Stalks, and sawed Leaves, which have Foot Stalks, and are almost Heart-shaped. This is the *Cataria minor vulgaris*. *Tourn. Inst. R. H.* 202. Smaller common Catmint.

3. *NEPETA floribus spicatis, verticillis subsessilibus, foliis cordato-oblongis serratis sessilibus*. Catmint with spiked Flowers, whose Whorls grow almost close to the Stalks, and oblong, sawed, Heart-shaped Leaves, sitting close. This is the *Cataria angustifolia major*. *Tourn. Inst. R. H.* 202. Greater narrow-leaved Catmint.

4. *NEPETA foliis linearibus, profundè dentatis, inferioribus petiolatis, superne sessilibus, verticillis pedicellatis longioribus*. Catmint with linear Leaves, deeply indented, the lower ones standing upon Foot Stalks, the upper ones sitting close, and Whorls of Flowers standing upon very long Foot Stalks. *Cataria angustifolia minor*. *Tourn. Inst.* Smaller narrow-leaved Catmint.

5. *NEPETA floribus paniculatis, foliis oblongo-cordatis acutis serratis sessilibus*. Catmint with paniced Flowers, and oblong, Heart-shaped, acute, sawed Leaves, sitting close to the Stalks. This is the *Cataria quæ nepeta minor, folio melissæ Turcicæ*. *Boerb. Ind. alt.* 1. 174. Smaller Catmint with a Turkey Balm Leaf.

6. *NEPETA floribus sessilibus verticillato-spicatis, bracteis lanceolatis longitudine calycis, foliis petiolatis*. *Lin. Sp. Plant.* 571. Catmint whose Flowers grow in whorled Spikes, sitting close to the Stalk, and having Spear-shaped Bractæ the Length of the Empalement, with Leaves growing upon Foot Stalks. This is the *Cataria minor Alpina*. *Tourn.* Smaller Alpine Catmint.

7. *NEPETA verticillis pedunculatis corymbosis, foliis petiolatis cordato-oblongis dentatis*. *Lin. Sp. Plant.* 570. Catmint with roundish Whorls standing upon Foot Stalks, and oblong, Heart-shaped, indented Leaves. This is the *Cataria Hispanica, betonica folio angustiore flore cæruleo*. *Tourn. Inst. R. H.* 202. Spanish Catmint with a narrow Betony Leaf, and a blue Flower.

8. *NEPETA floribus spicatis sessilibus, bracteis ovatis coloratis, verticilla excipientibus, foliis sessilibus*. *Hort. Cliff.* 311. Catmint with spiked Flowers sitting close to the Stalks, oval coloured Bractæ receiving the Whorls, and Leaves sitting close to the Stalks. This is the *Cataria Hispanica, supina, betonica folio, tuberosa radice*. *Tourn. Inst. R. H.* 202. Spanish Catmint with a declining Stalk, a Betony Leaf, and a tuberous Root.

9. *NEPETA floribus sessilibus verticillato-spicatis, verticillis tomento obvolutis*. *Hort. Cliff.* 311. Catmint with Flowers growing in whorled Spikes, sitting close to the Stalk, and the Whorls covered with Down. This is the *Horminum spicatum lavendulæ flore & odore*. *Bocc. Plant.* Spiked Clary with a Lavender Smell and Flower.

10. *NEPETA foliis lanceolatis, capitulis terminalibus, flaminibus flore longioribus*. *Lin. Sp. Plant.* 571. Catmint with Spear-shaped Leaves, Stalks terminated by Flowers growing in Heads, and Stamina longer than the Flower.

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Flower. This is the *Clinopodium amaraci folio, floribus albis*, Pluk. Alm. 110. Field Basil with a Marjoram Leaf, and a white Flower.

11. *NEPETA floribus spicatis, verticillis crassioribus, foliis cordatis obtusè dentatis petiolatis*. Catmint with spiked Flowers, whose Whorls are very thick, and Heart-shaped Leaves, which are obtusely indented, and stand upon Foot Stalks. *Cataria Orientalis, teucrii folio. lavendulae odore, verticillis florum crassissimis*. Tourn. Eastern Catmint with a Tree Germander Leaf, smelling like Lavender, and very thick Whorls to the Flowers.

12. *NEPETA floribus verticillatis, bracteis ovatis birsutis, foliis cordato-ovatis crenatis, caule procumbente*. Catmint with whorled Flowers, having oval hairy Bractees, oval Heart-shaped Leaves, which are crenated, and a trailing Stalk.

The 1st Sort is the common Nep, or Catmint, which grows naturally on the Side of Banks and Hedges, in England; this has a perennial Root, from which arise many branching Stalks, which are four-cornered about 2 Feet high, garnished at each Joint by two Heart-shaped Leaves, standing opposite on pretty long Foot Stalks; they are sawed on their Edges, and hoary on their under Side. The Flowers grow in Spikes at the Top of the Stalks, and below the Spikes are two or three Whorls of Flowers, which have very short Foot Stalks. The Flowers are white, and have two Lips; the upper Lip stands erect, and the lower is a little reflexed, and indented at the Point; these are each succeeded by 4 oval black Seeds, which ripen in the Empalement.

The whole Plant has a strong Scent between Mint and Penny Royal, it is called Catmint, because the Cats are very fond of it, especially when it is withered, for then they will roll themselves on it, and tear it to Pieces, chewing it in their Mouths with great Pleasure. Mr. Ray mentions his having transplanted some of these Plants from the Fields, into his Garden, which were soon destroyed by the Cats, but the Plants which came up from Seed in this Garden escaped, which verifies the old Proverb, viz. *If you set it, the Cats will eat it, if you sow it, the Cats dont know it*. I have frequently made Trial of this, and have always found it true; for I have transplanted one of the Plants from another Part of the Garden, within two Feet of some which came up from Seeds, the latter remained unhurt, when the former was torn to Pieces, and destroyed by the Cats; but I have always observed, where there is a large Quantity of the Herb growing together, they will not meddle with it. This flowers in June and July, and the Seeds ripen in Autumn. It is used in Medicine.

The 2d Sort grows naturally in Italy, and the South of France; the Stalks are slenderer, their Joints farther asunder; the Leaves narrower, and the whole Plant whiter than the first. The Spikes of Flowers are divided into Whorls; the lower of these are two Inches apart, others are an Inch, and the upper half an Inch; these Differences are permanent, for I have always found the Seeds produce the same Kind.

The Stalks of the 3d Sort do not branch so much as either of the former; they are slenderer, and their Joints farther asunder; the Leaves are small, narrow, and almost Heart-shaped, sawed on their Edges, hoary, and stand on short Foot Stalks. The Spikes of Flowers are

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more broken, or interrupted than those of the second, and the Whorls stand upon Foot Stalks. It grows naturally in Italy.

The 4th Sort hath slender Stalks, which branch out near the Ground. The Joints are far asunder; the Leaves are very narrow, and deeply sawed on their Edges; those on the lower Part of the Stalk, have Foot Stalks an Inch long, but the upper Leaves sit close to the Stalks. The Whorls of Flowers come out from the Wings of the Stalk, those on the lower Part have long Foot Stalks, but these shorten upward, and the Stalks are terminated by close Whorls.

The 5th Sort grows naturally in Sicily; this rises with a strong four cornered Stalk, near 3 Feet high; the lower Joints are 4 or 5 Inches asunder. The Leaves are long, narrow, and Heart-shaped, deeply sawed on their Edges, and set pretty close to the Stalk. The Flowers grow in Panicles along the Stalks, and are of a pale purplish Colour. It flowers about the same Time with the other Sorts.

The 6th Sort grows naturally on the Alps; the Stalks of this seldom rise more than a Foot and a Half high, sending out very few Branches. The Whorls of Flowers, which form the Spike, are distant from each other, and sit close to the Stalk. The Leaves are short, oval, Heart-shaped, and stand upon Foot Stalks; the Plant is hoary, and strong scented.

The 7th Sort grows naturally in Spain; the Stalks rise about 2 Feet high, and have a few slender Branches coming out from their Sides. The Leaves are Heart-shaped, and intended on their Edges. The Flowers grow in roundish Whorls, upon Foot Stalks, and are blue; there is a Variety of this with white Flowers.

The 8th Sort grows naturally in Portugal; this has a thick knobbed Root, from which come out one or two Stalks, which often decline to the Ground; they are about two Feet and a Half long, and send out two Side Branches, opposite. The Leaves are oblong, crenated on their Edges, sit close to the Stalks, and are of a deep green. The upper Part of the Stalk, for more than a Foot in Length, is garnished with Whorls of Flowers, the lower being two Inches asunder, but are nearer all the Way upward; these sit very close to the Stalks, and are guarded by oval, small, coloured Leaves. The Flowers are blue, and shaped like those of the other Species; there is one of this Sort with an erect Stalk, which is the only Difference between them.

The 9th Sort grows naturally in Sicily. The Stalks of this grow about 2 Feet high; the Branches come out toward the Bottom; they are Heart-shaped, obtuse, and but little indented, standing upon pretty long Foot Stalks. The Stalks are terminated by long Spikes of whorled Flowers, which are separated, and sit close to them; these are wrapped in a hoary Down. The Flowers are white, and appear in July.

The 10th Sort grows naturally in North America; this hath a perennial Root, from which arise several four-cornered Stalks, 2 Feet high, and garnished with hairy Leaves, somewhat like those of Marjoram, but larger. The Flowers grow in Whorls round the Stalks, and at the Extremity of the Stalk, in a large roundish Whorl, or Head; they are of a pale Flesh Colour, and their Stamina is longer than the Petal. It flowers in July.

The eleventh Sort grows naturally in the *Levant*, from whence the Seeds were sent to *Paris*, by Dr. *Tournesort*. The Stalks of this are strong, and rise near three Feet high. The Leaves are Heart-shaped, and have blunt Indentures on their Edges, standing on short Foot Stalks. The Flowers grow in whorled Spikes at the Top of the Stalks; the Whorls are very thick, and sit close together, terminating in an obtuse Point. The Flowers are of a pale Flesh Colour; the whole Plant is hoary, and has a strong Scent.

The 12th Sort grows naturally among the Rocks in *Candia*, where it is used as Water Germander by the Inhabitants; this hath four-cornered Stalks a Foot long, which trail on the Ground, sending out some slender Branches from the Side. The Leaves are very like those of the round leaved *Mentastrium*, sitting close to the Stalk. The Flowers grow in thick roundish Whorls, which sit close to the Stalk, and are surrounded by oval hairy Leaves. The Flowers are white, and just peep out of their Empalements. The Roots of this Sort seldom continue longer than 2 Years, but as the Seeds ripen well, so if they are permitted to scatter, the Plants will come up the following Spring.

All the Sorts are very hardy, so are not injured by Frost; they are easily propagated by Seeds, for if they are permitted to fall, the Plants will rise without Trouble; or if they Seeds are sown, either in Spring, or Autumn, the Plants will come up, and require no Culture, but to thin them where they are too close, and keep them clean from Weeds. If these Plants are sown on a poor dry Soil, they will continue much longer, and appear handsomer than in rich Ground, where they grow too luxuriant, and have not so strong a Scent.

NERIUM. *Lin. Gen. Plant.* 262. *Nerion. Tourn. Inst. R. H.* 604. *Tab.* 374. The Oleander, or Rose Bay; in *French*, *Laurier Rose*.

The Characters are,

The Empalement of the Flower is permanent, and cut into 5 acute Segments. The Flower has one Funnel-shaped Petal. The Tube is cylindrical; the Border large, and cut into 5 broad obtuse Segments, which are oblique. It hath a Nectarium terminating the Tube, which is torn into hairy Segments. It hath five short Awl-shaped Stamina within the Tube, with Arrow-pointed Summits joining together, terminated by a long Thread. It hath an oblong Germen, which is bifid, with scarce any Style, crowned by single Stigmas. The Germen turns to 2 long, taper, acute-pointed Pods, filled with oblong Seeds, lying over each other like the Scales of Fish, and crowned with Down.

The Species are,

1. **NERIUM** *foliis lineari-lanceolatis rigidis sepius ternis erectis.* Oleander, or Rose Bay, with linear Spear-shaped rigid Leaves, which are erect, and often placed by Threes round the Stalk. This is the *Nerion floribus rubescentibus.* *C. B. P.* 464. Oleander with red Flowers.

2. **NERIUM** *foliis linearibus rigidis.* Oleander, or Rose Bay, with linear rigid Leaves. This is the *Nerium Indicum, angustifolium, floribus odoratis simplicibus.* *H. L.* Narrow-leaved Indian Rose Bay, with single sweet scented Flowers.

3. **NERIUM** *foliis lanceolatis longioribus, flaccidis.* Rose Bay with longer Spear-shaped flaccid Leaves. This is the *Nerium Indicum latifolium, floribus odoratis*

plenis. *H. L.* Broad-leaved Indian Rose Bay with double sweet Flowers, called, The double Oleander.

The 1st Sort grows naturally in *Greece*, and several Parts near the *Mediterranean Sea*, generally by the Sides of Rivers and Brooks; there are two Varieties of this, one with white, the other with red Flowers, but seem to have no other Difference, so may properly be ranked as one Species, though that with white Flowers is rarely found wild in any Place, but the Island of *Crete*.

This rises with several Stalks, 8 or 10 Feet High. The Branches come out by Threes, round the principal Stalks; these have a smooth Bark, which in the red flowering is of a purplish Colour, but the white Sort hath a light green Bark. The Leaves for the most part stand by Threes round the Stalks, on very short Foot Stalks, and point upward; they are about 3 Inches long, and 3 Quarters of an Inch broad in the Middle, of a dark green, very stiff, and end in acute Points. The Flowers come out at the End of the Branches, in large loose Bunches, which are in one of a bright purple, or crimson Colour, and in the other they are of a dirty white; they have short Tubes, and spread open at Top, where they are deeply cut into 5 obtuse Segments, twisted at Bottom, so are oblique to the Tube. At the Mouth of the Tube, the torn capillary Nectarium is situated, and within the Tube are the 5 Stamina, with the Germen at Bottom, which turns to a brown taper double Pod, about 4 Inches long, which opens longitudinally on one Side, and is filled with oblong Seeds, crowned with long hairy Down, lying over each other like the Scales of Fish. This Plant flowers in *July* and *August*, and in warm Seasons they are succeeded by Pods, but the Seeds seldom ripen well here.

When the Summers are warm and dry, these Plants make a fine Appearance, for then they open and flower in great Plenty; but, in cold moist Seasons, the Flowers often decay without expanding, and the Sort with white Flowers, is more tender than the red, so that unless the Weather is warm and dry, at the Time the Flowers appear, they rot and make no Figure, unless they are placed under Glasses to screen them.

The 2d Sort grows naturally in *India*; this rises with shrubby Stalks, 6 or 7 Feet high, which are covered with a brown Bark, and garnished with stiff Leaves, from 3 to 4 Inches long, and not more than a Quarter of an Inch broad; they are of a light green, and their Edges reflexed; these are placed sometimes by Pairs opposite, at others they are alternate, and sometimes by Threes round the Branches. The Flowers are produced in loose Bunches at the End of the Branches; they are of a pale red, and have an agreeable musky Scent. It flowers at the same Time with the former, but they seldom blow here in the open Air, so unless the Plants are placed in an airy Glass Case, and defended from Wet and Cold, they will not flower.

The 3d Sort grows naturally in both *Indies*; this Plant was first introduced to the *British Islands* in *America*, from the *Spanish Main*, and is called by the Inhabitants of those Islands *South Sea Rose*; the Beauty and Sweetness of its Flowers engaged the Inhabitants of the Islands to cultivate the Plants, so that in many Places they were planted for Hedges; but the Cattle browsing on them when there was Scarcity of Food, were many of

of them killed, which has occasioned their being destroyed in all Places exposed to Cattle, so that now they are only preserved in Gardens, where they make a fine Appearance great Part of the Year, for in those warm Countries, they are seldom destitute of Flowers; this has been by some Persons, who have only a superficial Knowledge of Plants, thought only a Variety of the common Sort, but those who have cultivated both, know better; for the first will live through the Winter in a warm Situation, but this is too tender to thrive in England, unless preserved in a warm Green-house; nor will the Plants flower without the Assistance of a Glass Case in Summer. The 3d Sort was not known here till the Beginning of last Century, being a Stranger in Europe, but the former has been in the English Gardens near two Centuries: Nor has the Seeds of the 1st ever produced Plants of the 3d Sort, though it has been positively asserted by Persons of no Skill.

The Leaves of this Sort are 6 Inches long, and one Inch broad in the Middle, of a much thinner Texture than those of the first, and their Ends are generally reflexed; they are of a light green, and irregularly placed on the Branches; sometimes they are by Pairs, at others alternate, and sometimes by Threes round the Branches. The Flowers are produced in very large Bunches at the End of the Branches, standing upon long Foot Stalks; they have 3 or 4 Series of Petals within each other, so are more or less double. The Flowers are much larger than those of the common Sort, and smell like the Flowers of Hawthorn. The plain Flowers are of a soft red, or Peach Colour; but in most they are beautifully variegated with a deeper red, and make a fine Appearance. Their usual Time of flowering is in July and August, but if they are placed in a warm Stove, they will continue to *Michaelmas*. As the Flowers of this are double, they are not succeeded by Seeds, and at present we are unacquainted with the single flowering of this Kind, for the 2d is undoubtedly a distinct Species.

All the Species of the Rose Bay, are supposed to have a poisonous Quality; the young Branches, when cut, or broken, have a milky Sap, or Juice, and the larger Branches, when burnt, emit a very disagreeable Odour, so there is great Reason to believe the Plants have some noxious Quality; but this Genus has been confounded by many Writers on Botany, with the *Chamaerhodoendros* of Tournefort, and many of the noxious Qualities with which the latter abounds, have been applied to the *Nerium*, particularly that of the Honey, about *Trebisund*, which is reckoned very unwholesome; this has been supposed to be occasioned by the Bees sucking it from the Flowers of the *Nerium*, whereas it is from the Flowers of the *Chamaerhodoendros*, as Tournefort has fully informed us; but the Affinity of their Names in the Greek Language, has occasioned these two Plants to be often confounded.

These Plants are generally propagated by Layers in this Country, for although they will sometimes take Root from Cuttings, yet that being an uncertain Method, the other is generally pursued; and as the Plants are very apt to produce Suckers, or Shoots from their Roots, those are best adapted for laying, for the old Branches will not put out Roots; when these are laid down, they should be slit at a Joint, in the same Man-

ner as practised in laying Carnations, which will greatly facilitate their taking Root; if these Branches are laid in Autumn, and properly supplied with Water, they will take Root in 12 Months, when they should be carefully raised up with a Trowel, and if they have taken good Root, they should be cut off from the old Plant, and each planted in a separate small Pot, filled with soft loamy Earth; those of the common Sort will require no other Care, but to be placed in a shady Situation, and gently watered as the Season may require, till they have taken new Root; but the two other Species should be plunged into a very moderate hot Bed, to forward their taking Root, observing to shade them from the Sun in the Heat of the Day; after the common Sort has taken new Root, the Plants may be placed in a sheltered Situation with other hardy Exoticks, where they may remain till the End of October, when they should be removed into the Green-house, or placed under a hot Bed Frame, where they may be protected from Frost in Winter, but enjoy the free Air at all Times when the Weather is mild.

This Sort is so hardy as to live abroad in mild Winters, if planted in a warm Situation, but as they are liable to be destroyed in severe Frost, the best Way is to keep the Plants in Pots, or if they are very large in Tubs, that they may be sheltered in Winter, and removed abroad in Summer placing them in a warm sheltered Situation. In Winter they may be placed with Myrtles and other hardier Kinds of Exoticks, in a Place where they may have as much free Air as possible, in mild Weather, but screened from severe Frost; for if these are kept too warm in Winter, they will not flower strong, and when the Air is excluded from them, the Ends of their Shoots will become mouldy, so that the harder they are treated, provided they are not exposed to hard Frosts, the better they will thrive.

The other two Sorts require a different Treatment, otherwise they will not make any Appearance; therefore the young Plants when they have taken new Root should be gradually inured to bear the open Air, into which they should be removed in July, where they may remain till October, provided the Weather continues mild; but during this Time, they should be placed in a sheltered Situation; and on the first Approach of Frost, they should be removed into Shelter, for if their Leaves are injured by it, they will change to a pale yellow, and will not recover their usual Colour till the following Autumn. These Sorts may be preserved in a good Green-house through the Winter, and the Plants will be stronger than those which are more tenderly treated; but in May, when the Flower Buds begin to appear, the Plants should be placed in an open Glass Case, where they may be defended from the Inclemency of the Weather; but when it is warm, the Air should at all Times be admitted to them in Plenty. With this Management the Flowers will expand, and continue long in Beauty; and during that Time, there are few Plants which are equal to them, either to the Eye or Nose, for their Scent is very like that of the Flowers of the White Thorn, and the Bunches of Flowers will be very large, if the Plants are strong.

NERVES are long tough Strings, which run either across, or Lengthways, in the Leaves of Plants.

NICOTIANA.

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NICOTIANA *Tourn. Inst. R. H. 117. Tab. 41. Lin. Gen. Plant. 220.* [This Plant takes its Name from *James Nicotius*, Counsellor to *Francis II.* King of France, who in the Year 1560, being Ambassador to the Court of Portugal, bought the Seeds of a Dutchman, who brought them from America, and sent them to Queen *Catharine de Medices* in France; The Indian Inhabitants call it *Tabac*, because it grew in an Island called *Tabaco*, or *Tobago*. The lesser Sort is by some called *Hyoscyamus*, because it agrees in some of its Characters with this Plant; it is also called *Priapria*.] Tobacco; in French, *Nicotiane* ou *Tabac*.

The Characters are,

The Empalement of the Flower is permanent, of one Leaf, cut into 5 acute Segments. The Flower has one Funnel-shaped Petal, with a long Tube spread open at the Brim, and ending in 5 acute Points. It hath 5 Awl-shaped Stamina the Length of the Tube, a little inclined, and terminated by oblong Summits, and an oval Germen supporting a slender Style, crowned by an indented Stigma. The Germen turns to an oval Capsule, with a Furrow on each Side, having two Cells which open at the Top, and are filled with rough Seeds fastened to the Partition.

The Species are,

1. **NICOTIANA** *foliis ovato-lanceolatis rugosis, semiamplexicaulibus.* Tobacco with oval, Spear-shaped, rough Leaves, which half embrace the Stalks. This is the *Hyoscyamus Peruvianus*. *Ger. 357.* Tobacco or Henbane of Peru.

2. **NICOTIANA** *foliis lanceolatis sessilibus.* Tobacco with Spear-shaped Leaves fitting close to the Stalks. This is the *Nicotiana major latifolia*. *C. B. P. 169.* Greater broad leaved Tobacco.

3. **NICOTIANA** *foliis lanceolatis acutis, sessilibus, calycibus acutis, tubo floris longissimo.* *Plat. 185.* Tobacco with acute, Spear-shaped Leaves fitting close to the Stalks, sharp-pointed Empalements, and a very long Tube to the Flower. This is the *Nicotiana major angustifolia*. *C. B. P. 170.* Greater narrow leaved Tobacco.

4. **NICOTIANA** *foliis lineari-lanceolatis acuminatis semiamplexicaulibus, caule fruticoso.* Tobacco with linear, Spear-shaped, acute-pointed Leaves, half embracing the Stalks, and a shrubby Stalk. This is the *Nicotiana major angustifolium folio perennis*. *Juss.* Narrowest leaved greater perennial Tobacco.

5. **NICOTIANA** *foliis ovatis acuminatis semiamplexicaulibus, capsulis ovatis obtusis.* Tobacco with oval, acute-pointed Leaves, half embracing the Stalk, and oval obtuse Seed Vessels. *Nicotiana major latifolia, floribus albis, vasculo brevi.* *Martyn.* Greater broad leaved Tobacco with white Flowers, and a short Seed Vessel.

6. **NICOTIANA** *foliis ovato-lanceolatis sessilibus, caule fruticoso perenni.* Tobacco with oval, Spear-shaped Leaves fitting close to the Stalks, and a shrubby perennial Stalk.

7. **NICOTIANA** *foliis ovatis.* *Hort. Cliff. 56.* Tobacco with oval Leaves. *Nicotiana minor.* *C. B. P.* Smaller Tobacco, commonly called *English Tobacco*.

8. **NICOTIANA** *foliis ovatis rugosis petiolatis.* Tobacco with oval, rough Leaves, having Foot Stalks. *Nicotiana minor, foliis rugosioribus amplioribus.* *Vaill.* Smaller Tobacco with larger and rougher Leaves.

9. **NICOTIANA** *foliis cordatis, floribus paniculatis, tu-*

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bis clavatis. *Lin. Sp. Pl.* Tobacco with Heart-shaped Leaves, paniculated Flowers, and Club-shaped Tubes. This is the *Nicotiana minor, folio cordiformi tubo floris praelongis* *Feuill. Obs.* Smaller Tobacco with a Heart-shaped Leaf, and a very long Tube to the Flower.

10. **NICOTIANA** *foliis cordatis, corollis racemosis subringentibus, calycibus inequalibus.* *Lin. Sp. Plant. 181.* Tobacco with Heart-shaped Leaves, branching ringent Petals, and unequal Empalements.

11. **NICOTIANA** *foliis ovato-lanceolatis obtusis rugosis, calycibus brevissimis.* *Plat.* Tobacco with oval, Spear-shaped, obtuse, rough Leaves, and a very short Empalement. This is the *Nicotiana humilis, primula veris folio.* *Houft. Mss.* Dwarf Tobacco with a Primrose Leaf.

The first Sort is most commonly sown in England, and has been generally taken for the broad leaved Tobacco of *Casper Bauhin*, and others, but is greatly different from it. The Leaves of this are more than a Foot and a Half long, and a Foot broad, the Surface very rough and glutinous: These Plants in a rich moist Soil, will grow more than 10 Feet high, the Base of the Leaves half embrace the Stalks; the upper Part of the Stalk divides into smaller Branches, terminated by loose Bunches of Flowers standing erect; they have pretty long Tubes, and are of a pale purplish Colour. It flowers in July and August, and the Seeds ripen in Autumn. This is the Sort of Tobacco which is commonly brought to the Markets in Pots to adorn the Shops and Balconies of London, by some called *Oroonoko Tobacco*.

The 2d Sort is the broad leaved Tobacco of *Casper Bauhin*; the Stalks of this seldom rise more than 5 or 6 Feet high, and divide into more Branches than the first. The Leaves are about ten Inches long and three and a Half broad, smooth, and end in acute Points, fitting close to the Stalks; the Flowers of this are rather larger, and of a brighter purple than those of the first. It flowers and perfects Seeds at the same Time; this is by some called sweet-scented Tobacco.

The 3d Sort rises with an upright branching Stalk, 4 or 5 Feet high; the lower Leaves are a Foot long, and 3 or 4 Inches broad; those on the Stalks are much narrower, lessening to the Top, and end in very acute Points, fitting close to the Stalks; they are very glutinous. The Flowers grow in loose Bunches at the Top of the Stalks, they have long Tubes, and are of a bright purple or red Colour. These Flower and ripen Seeds at the same Time with the former.

The 4th Sort rises with very branching Stalks about 5 Feet high; the Leaves on the lower Part of the Stalks are a Foot and a Half long, broad at the Base where they half embrace the Stalks, and are about 3 Inches broad in the Middle, terminating in long acute Points; the Stalks divide into many smaller Branches, terminated by loose Bunches of Flowers, of a bright purple, and are succeeded by acute-pointed Seed Vessels. This flowers about the same Time, but if the Plants are placed in a warm Green-house, they will live through the Winter. The Seeds of this Sort were sent me for *Brazil Tobacco*.

The 5th Sort grows naturally in the Woods in the Island of *Tobago*, from whence the Seeds were sent me by the late Mr. *R. Millar*. This rises about 5 Feet high; the

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the Stalk does not branch so much as those of the former; the Leaves are large and oval, about 15 Inches long and 2 broad in the Middle, but diminish gradually in their Size to the Top of the Stalk, and with their Base half embrace it. The Flowers grow in closer Bunches than the former, and are white; these are succeeded by short, oval, obtuse Seed Vessels. It flowers and perfects Seeds about the same Time.

The 6th Sort grows naturally at *Senegal*, from whence the Seeds were sent by Mr. *Adanson*, to the Royal Garden at *Paris*. This rises about 4 or 5 Feet high; the lower Leaves are 9 Inches long, and 4 broad in the Middle; they are smooth, and sit close to the Stalks; the upper Leaves are of the same Form, but gradually diminish upward. The Flowers are collected in pretty close Bunches, they are of a pale purple and are succeeded by oblong Seed Vessels, inclosed in the acute five-pointed Empalement. The Stalks are perennial, and put out Shoots from their Joints; if the Plants are sheltered in Winter, they will live 2 or 3 Years.

The 7th Sort is commonly called *English Tobacco*, being the first which was introduced here, and much more hardy than the other Sorts. The Seeds ripen very freely, and scattering in Autumn, the Plants come up without Care, so that it has been a Weed in many Places; but it came originally from *America*, by the Title of *Petum*, *Dodonaus*, *Tabernemontanus*, also *Elyoscyamus luteus*, from the Affinity there is between this Plant and the Henbane; but the Flowers of this are tubulous, and not ringent, as are those of the Henbane; nor do the Seed Vessels open with a Lid on the Top, as those of Henbane. The Stalks of this seldom rise more than 3 Feet high; the Leaves are placed alternately on the Stalks, standing on short Foot Stalks; they are oval and smooth. The Flowers grow in small loose Bunches on the Top of the Stalks; they have short open Tubes, which spread open at the Top, and are cut into 5 obtuse Segments. They are of an herbaceous yellow Colour, appearing in *July*, and are succeeded by roundish Capsules, filled with small Seeds, which ripen in Autumn.

The 8th Sort rises with a strong Stalk near 4 Feet high; the Leaves are shaped like the former, but are greatly furrowed on their Surface, and near twice the Size of the former, of a darker green, and have longer Foot Stalks. The Flowers are larger, and of the same Shape. This is undoubtedly a distinct Plant from the former, for I have sown the Seeds more than 30 Years, and have never found any of the Plants vary.

The 9th Sort was found growing naturally in the Valley of *Lima*, by *Pere Feuille*, in the Year 1710; and of late the Seeds were sent from *Peru*, by the younger *de Jussieu*, to *Paris*. The Stalk of this rises more than 3 Feet high, dividing upward into many smaller Branches, which are round and a little hairy; the Leaves are Heart-shaped about 4 Inches long and 3 broad, standing on pretty long Foot Stalks. The Flowers are produced in loose Panicles at the End of the Branches, these have Tubes about an Inch long, shaped like a Club; the Brim is slightly cut into 9 obtuse Segments, reflexed; they are of a yellowish green Colour, and are succeeded by roundish Capsules, filled with very small Seeds. It flowers about the same Time with the other Sorts.

The Seeds of the 10th Sort were sent from *Peru* with

those of the former; the Stalk is round, and rises near 4 Feet high, sending out 2 or 3 Branches from the lower Part; the Leaves are large, Heart shaped, a little waved; and very clammy, standing on long Foot Stalks. The Flowers grow in long loose Spikes at the Top of the Stalk, having short open Tubes, curved almost like the Lip Flowers; they are of a dull purple Colour; the Empalement is unequally cut, one of the Segments being twice the Size of the other.

The 11th Sort was discovered by Dr. *Houssonn* at *La Vera Cruz*, who sent the Seeds to *England*. This hath a pretty thick taper Root, which strikes deep in the Ground; at the Top comes out 6 or 7 oval Spear-shaped Leaves, which spread on the Ground; they are about the Size of those of the common Primrose, but of a deeper green; the Stalk rises about a Foot high, branching into 3 or 4 Divisions, at each of these is placed one small Leaf; the Branches are terminated by a loose Spike of Flowers, which are small, tubulous, and of a yellowish green Colour, having very short Empalements, which are cut at the Brim into 5 acute Segments. The Seed Vessel is small, oval, and divided into two Cells, which are full of small Seeds.

All the Sorts except the 7th and 8th, require the same Culture, and are too tender to grow from Seeds sown in the full Ground, to any Degree of Perfection in this Country, so require to be raised in a hot Bed, after the following Manner:

The Seeds must be sown upon a moderate hot Bed in *March*, and when the Plants are come up fit to remove, they should be transplanted into a new hot Bed of a moderate Warmth, about 4 Inches asunder each Way, observing to water and shade them until they have taken Root; after which let them have Air in Proportion to the Warmth of the Season, otherwise they will draw up weak, and be less capable of enduring the open Air: water them frequently, but while they are very young, it should not be given to them in two great Quantities; though when they are pretty strong, they will require it often, and in Plenty.

In this Bed the Plants should remain until the Beginning of *May*, by which Time (if they have succeeded well) they will touch each other, therefore they should be inured to bear the open Air gradually; after which they must be taken up carefully, preserving a large Ball of Earth to each Root, and planted into a rich light Soil, in Rows 4 Feet asunder, and the Plants 3 Feet Distance in the Rows, observing to water them until they have taken Root; after which they require no farther Care (only to keep them clear from Weeds) until the Plants begin to shew their Flower Stems; at which Time you should cut off the Tops of them, that their Leaves may be the better nourished, whereby they will be rendered larger, and of a thicker Substance. In *August* they will be full grown, when they should be cut for Use; for if they are permitted to stand longer, their under Leaves will begin to decay. This is to be understood for such Plants as are propagated for Use, but those designed for Ornament, should be planted in the Borders of the Pleasure Garden, and permitted to grow their full Height, where they will continue flowering from *July*, till the Frost puts a Stop to them.

The two smaller Sorts of Tobacco are preserved in

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Botanick Gardens for Variety, but seldom propagated for Use. The 1st Sort is found growing on Dunghills, in divers Parts of England. These are both very hardy, and may be propagated by sowing their Seeds in March, on a Bed of light Earth, where they will come up, and may be transplanted into any Part of the Garden, where they will thrive without Care.

The last Sort being somewhat tenderer than the other, should be sown early in the Spring on a hot Bed; and when the Plants come up, they should be transplanted on another moderate hot Bed, where they must be duly watered, and have a large Share of free Air in warm Weather; when the Plants have obtained a good Share of Strength, they should be transplanted into separate Pots, and plunged in a moderate hot Bed to bring them forward. About the Middle of June some of the Plants may be shaken out of the Pots, and planted in Beds of rich Earth; but it will be proper to keep some Plants in Pots, which may be placed in the Stove (in Case the Season should prove bad,) to ripen their Seeds, that the Species may be preserved.

NIGELLA. *Tourn. Inst. Lin. Gen. Plant.* 606. Fennel Flower, or Devil in a Bush.

The Characters are,

The Flower has no Empalement, but a leafy Perianthium. It hath 5 oval, obtuse, plain Petals, which spread open, and are contracted at their Base, and 8 very short Nectariums situated in a Circle, each having two Lips; the exterior being larger, the interior bifid, plain and convex; the interior is shorter, narrower, from an oval terminating in a Line. It hath a great Number of Awl-shaped Stamina, shorter than the Petals, terminated by obtuse, compressed, erect Summits; and in some five, in others ten, oblong, convex, erect Germen, ending in Awl-shaped Styles, which are long, revolved, and permanent, having Stigmas fastened longitudinally to them. The Germen afterward become so many oblong compressed Capsules, divided by a Furrow, but connected within, filled with rough angular Seeds.

The Species are,

1. NIGELLA *pistillis quinis, petalis integris, capsulis turbinatis. Lin. Sp. Plant.* 534. Fennel Flower having five Pointals, entire Petals, and turbinated Seed Vessels. This is the *Nigella arvensis cornuta*. C. B. P. Field horned Fennel Flower.

2. NIGELLA *floribus involucri folioso cinctis. Hort. Cliff.* 215. Fennel Flower whose Flowers are encompassed with a leafy Involucrum. *Nigella angustifolia, flore majore simplici caeruleo.* C. B. P. 145. Narrow-leaved Fennel Flower, with a larger single blue Flower.

3. NIGELLA *petalis subtricuspidatis, foliis subpilis. Hort. Upsal.* 154. Fennel Flower with Petals, which are almost three-pointed, and Leaves somewhat hairy. This is the *Nigella flore minore simplici candido.* C. B. P. 145. Fennel Flower with a smaller single white Flower.

4. NIGELLA *pistillis quinis, corolla longioribus, petalis integris.* Fennel Flower with five Pointals longer than the Petals, which are entire. This is the *Nigella Cretica latifolia odorata.* Park. *Theat.* 1376. Broad-leaved sweet-smelling Fennel Flower of Crete.

5. NIGELLA *pistillis denis corolla brevioribus.* Fennel Flower with ten Pointals, which are shorter than the Petals. This is the *Nigella alba simplici flore.* Alp. *Exot.* 261. Fennel Flower with a single white Flower.

6. NIGELLA *pistillis denis corollam aequantibus. Hort. Upsal.* 154. Fennel Flower with ten Pointals equalling the Petals. This is the *Nigella latifolia flore majore simplici caeruleo.* C. B. P. 145. Broad-leaved Fennel Flower with a large single blue Flower.

7. NIGELLA *pistillis denis corolla longioribus. Hort. Cliff.* 215. Fennel Flower with ten Pointals, longer than the Petals. *Nigella Orientalis, flore flavescente, semine alato plano.* *Tourn.* Fennel Flower of the East, with a yellowish Flower, and a plain winged Seed.

The 1st Sort grows naturally among the Corn, in France, Italy, and Germany, so is seldom propagated in Gardens; this rises with slender Stalks, near a Foot high, which sometimes branch out at Bottom, and at others they are single, garnished with a few very fine cut Leaves, somewhat like Dill; each Stalk is terminated by one Star-pointed Flower of 5 Petals, of a pale blue Colour, and no leafy Involucrum under them; these are succeeded by Capsules, have 5 short Horns, which incline different Ways at Top, and are filled with rough black Seeds; there is a Variety of this with white Flowers, and another with double Flowers.

The 2d Sort grows naturally in Spain and Italy, among the Corn; this rises with an upright branching Stalk, a Foot and a Half high, garnished with Leaves much longer, and finer than those of the first. The Flowers are large, of a pale blue, and have a long leafy Involucrum under each; these are succeeded by larger swelling Seed Vessels, with Horns at Top; of this there is one with single white Flowers, and another with double, which is sown in Gardens for Ornament.

The 3d Sort grows naturally in Crete; and rises about the same Height. The Leaves are not so finely cut as those of the 2d, and are a little hairy. At the Top of each Stalk is one Flower, composed of 5 white Petals, slightly cut at their End into 3 Points; these are succeeded by oblong swelling Seed Vessels, with 5 Horns at Top, filled with small pale coloured Seeds.

The 4th Sort grows naturally in Crete; this rises with branching Stalks about a Foot high, garnished with shorter and broader Leaves than any of the other Species. At the Top of each Branch is one Flower, having no Involucrum; they are composed of 5 oval Petals, and have 5 Pointals longer than the Petals; the Seed Vessel is not much swollen, and has 5 slender Horns at Top; the Seeds are of a light yellowish brown.

The 5th Sort is a Native of Crete; this rises with a branching Stalk a Foot high, garnished with Leaves like those of Larkspur. The Flowers have 5 large oval Petals which are entire, with ten Pointals shorter than the Petals, and a great Number of green Stamina with blue Chives; the Seed Vessels are like the last.

The 6th Sort rises a Foot and a Half; the lower Leaves are finely cut, but those on the Stalks are cut into broader Segments. The Flowers are larger than those of the other Species, and a fine blue: The Pointals are of equal Length with the Petals; the Seed Vessel has 5 Horns, and is of a firmer Texture than any of the other. It grows naturally in the South of France and Spain; there is a Variety of this with double Flowers.

The 7th Sort grows naturally in the Corn about Aleppo; this rises with a branching Stalk a Foot and a Half high, garnished with pretty long Leaves, finely divided.

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The Flowers are produced at the End of the Branches they are composed of 5 yellowish Petals; at the Base of these are placed 8 Nectariums, between which arise a great Number of Stamina, with an unequal Number of Germen, some having but five, others have eight or nine; they are oblong and compressed; these become so many oblong compressed Seed Vessels joined together on their inner Side, terminating with Horns, and open longitudinally, containing many thin compressed Seeds, having Borders round them.

The Varieties of these with double Flowers, are chiefly propagated in Gardens for Ornament; but those with single Flowers are rarely admitted into any but Botanick Gardens, for the Sake of Variety.

All these Plants may be propagated by sowing their Seeds upon a Bed of light Earth, where they are to remain (for they seldom succeed well if transplanted;) therefore, in order to have them intermixed amongst other annual Flowers in the Borders of the Flower Garden, the Seeds should be sown in Patches at proper Distances; when the Plants come up, pull up those which grow too close, leaving but three or four in each Patch, and keep them clear from Weeds, which is all the Culture they require. In *July* they will flower, and their Seeds will ripen in *August*, when they should be gathered and dried; then rub out each Sort separately, and preserve them in a dry Place.

The Season for sowing these Seeds is in *March*; but if you sow some of them in *August*, soon after they are ripe, on a dry Soil in a warm Situation, they will abide the Winter, and flower strong the succeeding Year; so by sowing the Seeds at different Times, they may be continued in Beauty most Part of the Summer.

They are all annual Plants, and perish soon after they have perfected their Seeds; which, if permitted to scatter on the Borders, will come up without Care.

NIGELLASTRUM. See *Agrostemma*.

NIGHTSHADE. See *Solanum*.

NIGHTSHADE, the Deadly. See *Belladonna*.

NIL. See *Anil*.

NISSOLIA. See *Lathyrus*.

NOLI ME TANGERE. See *Impatiens*.

NONSUCH, or FLOWER of BRISTOL. See *Lychnis*.

NORTHERN ASPECT is the least favourable of any in *England*, as having very little Benefit from the Sun, even in the Height of Summer, therefore can be of little Use, whatever may have been advanced to the contrary; for although many Sorts of Fruit Trees will thrive and produce Fruit in such Positions, yet such Fruit can be of little Worth, since they are deprived of the kindly Warmth of the Sun to correct their crude Juices, and render them well tasted and wholesome; therefore it is to little Purpose to plant Fruit Trees against such Walls, except it be those which are intended for Baking, &c. where the Fire will ripen, and render those Juices wholesome, which, for want of Sun, could not be performed while growing.

You may also plant Morello Cherries, for Preserving; and white and red Currants, to come late, after those which are exposed to the Sun are gone; and if the Soil be warm and dry, some Sorts of Summer Pears will do tolerably well on such an Exposure, and will continue

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longer in eating, than if they were more exposed to the Sun. But you should by no Means plant Winter Pears in such an Aspect, as hath been practised by many ignorant Persons, since we find, that the best South Walls, in some bad Years, are barely warm enough to ripen those Fruits.

Duke Cherries planted against Walls exposed to the North, will ripen much later in the Season, and, if the Soil is warm, they will be well flavoured, so that hereby this Fruit may be continued a Month later than is usual.

NUCIFEROUS TREES, are such as produce Nuts.

NUMMULARIA. See *Lysimachia*.

NURSERY, or Nursery Garden, is a Piece of Land set apart for raising and propagating all Sorts of Trees and Plants to supply the Garden, and other Plantations. Of this Sort there are a great Number in different Parts of this Kingdom, but particularly in the Neighbourhood of *London*, which are occupied by the Gardeners, whose Business it is to raise Trees, Plants, and Flowers for Sale; and in many of these there is at present a much greater Variety of Trees and Plants cultivated, than can be found in any other Part of *Europe*. In *France*, their Nurseries, (which are but few, when compared with those in *England*) are chiefly confined to the Propagation of Fruit Trees, from whence they have the Appellation of *Pepinier*. For there is scarce any of those Gardens, where a Person can be supplied either with Ever-greens, flowering Shrubs, or Forest Trees. And in *Holland*, their Nurseries are principally for Flowers; some few of them, indeed, propagate tender exotic Plants. But those Nurseries in the Neighbourhood of *London* do, several of them, include all these, and from hence most of the curious Persons abroad are supplied with Furniture for their Gardens. I do not propose in this Place, to treat of these extensive Nurseries, or to give a Description of them, therefore shall confine myself to treat of such Nurseries only as are absolutely necessary for all Lovers of planting, to have upon the Spot, where they design to make their Plantations. For if these are large, the Expence of carrying a great Number of Trees, if the Distance is great, will be no small Article, beside the Hazard of their growing; which, when Plants have been trained up in good Land, and removed to an indifferent one, is very great. Therefore it is of the utmost Consequence to every Planter, to begin by making a Nursery. In this Article I must beg Leave to observe, that a Nursery should not be fixed to any particular Spot: I mean by this, that it would be wrong to continue raising Trees any Number of Years upon the same Spot of Ground, because hereby the Ground will be so much exhausted by the Trees, as to render it unfit for the same Purpose. Therefore all good Nursery Gardeners shift and change their Land from Time to Time, for when they have drawn off the Trees from a Spot of Ground, they plant Kitchen Herbs, &c. on the Ground for a Year or two, by which Time, as also by dunging and trenching the Land it is recovered, and made fit to receive other Trees. But this they are obliged to from Necessity, being confined to the same Land; which is not the Case with Gentlemen, who have large Extent of Ground in the Country. Therefore all such

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Persons I would advise to make Nurseries upon the Ground which is intended for Planting, where a sufficient Number of the Trees may be left standing, after the others have been drawn out, to plant in other Places; which, for all large growing Trees, but particularly such as are cultivated for Timber, will be found by much the most advantageous Method; for all those Trees which come up from the Seed, or which are transplanted very young into the Places where they are designed to remain, will make a much greater Progress, and become larger Trees, than any of those which are transplanted at a greater Age. Therefore the Nurseries should be thinned early, by removing all those Trees which are intended for other Plantations while they are young, because hereby the Expence and Trouble of staking, watering, &c. will be saved, and the Trees will succeed much better. But in exposed Situations, where there are Nurseries, it will be necessary to permit the Trees to stand much longer; that, by growing close together, they may shelter each other, and draw themselves up; and these should be thinned gradually, as the Trees advance; for, by taking away too many at first, the Cold will check the Growth of the remaining Trees. But then those Trees which are taken out from these Nurseries, after a certain Age, should not be depended on for Planting; and it will be Prudence rather to consign them for Fuel, than by attempting to remove them large, whereby, in endeavouring to get them up with good Roots, the Roots of the standing Trees will be often much injured.

What has been here proposed, must be understood for all large Plantations in Parks, Woods, &c. but those Nurseries intended only for raising Evergreens, Flowering Shrubs, or Plants to embellish Gardens, may be confined to one Spot, because a small Compas of Ground will be sufficient for this Purpose. Two or three Acres of Land employed this Way, will be sufficient for the most extensive Designs, and one Acre will be full enough for those of moderate Extent. Such a Spot of Ground may be always employed for sowing the Seeds of foreign Trees and Plants, as also for raising many Sorts of biennial and perennial Flowers, to transplant into the Borders of the Pleasure Garden, and for raising many Kinds of bulbous-rooted Flowers from Seeds, whereby a Variety of new Sorts may be obtained annually, as a recompence for the Trouble and Expence, and will be an agreeable Diversion to all who delight in the Amusements of Gardening.

Such a Nursery as this should be conveniently situated for Water; to save the Expence of Carriage in dry Weather. It should also be as near the House as it can with Convenience be admitted, in order to render it easy to visit all Times of the Year, because it is absolutely necessary, that it should be under the Inspection of the Master, for unless he delights in it, there will be little Hopes of Success. The Soil of this Nursery should be good, and not too heavy and stiff, for such Land will be very improper for sowing most Sorts of Seeds, because as this will detain the Moisture in Winter and Spring, the Seeds of most tender Things, especially of Flowers, will rot in the Ground, if sown early; therefore where Persons are confined to such Land there should be a good Quantity of Sand, Ashes, and other light Manures buried, in order to separate the Parts, and pulverize the

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Ground; and if it is thrown up in Ridges, to receive the Frost in Winter, it will be of great Use to it, as will also the frequent forking, or stirring the Ground, both before and after it is planted.

The many Advantages which attend the having such a Nursery, are so obvious to every Person who has turned his Thoughts in the least to this Subject, that it is needless to mention them here; and therefore I shall only beg Leave to repeat here what I have so frequently recommended, which is, the carefully keeping the Ground always clean from Weeds; for if these are permitted to grow, they will rob the young Trees of their Nourishment. Another principal Business is, to dig the Ground between the young Plants at least once every Year, to loosen it for the Roots to strike out; but if the Ground is stiff, it will be better to be repeated twice a Year, viz. in *October* and *March*, which will greatly promote the Growth of the Plants, and prepare their Roots for transplanting.

As some Persons may have the Curiosity to raise their own Fruit Trees, I shall next treat of the proper Method to make a Nursery of these Trees.

In the doing of which you must observe the following Rules:

1. That the Soil in which you make the Nursery be not better than that where the Trees are to be planted out for good; the not observing this, is the Reason that Trees are often at a Stand, or make but little Progress for three or four Years, after they come from the Nursery, as commonly happens to such Trees as are raised near *London*, and carried into the northern Parts of *England*, where being planted in a poor Soil, and a much colder Situation, the Trees seldom succeed well; therefore it is by far the better Method (when you have obtained the Sorts you would propagate) to raise a Nursery of the several Sorts of Stocks proper for the various Kinds of Fruit, upon which you may bud or graft them, and those Trees which are thus raised upon the Soil, and in the same Degree of Warmth, where they are to be planted, will succeed much better than those brought from a greater Distance, and from a richer Soil.

2. This Ground ought to be fresh, and not such as has been already worn out by Trees, or other large growing Plants, for in such Soil your Stocks will not make any Progress.

3. It ought not to be too wet, nor over dry, but rather of a middling Nature; though of the two Extremes, dry is to be preferred, because in such Soils (though the Trees do not make so great a Progress as in moist, yet) they are generally sounder, and more disposed to Fruitfulness.

4. You must also observe to inclose it, that Cattle and Vermin may not come in, for these will make sad Havock with young Trees, especially in Winter, when the Ground is covered with Snow, that they cannot come at other Food. Some of the most mischievous of these Animals are Hares and Rabbits, which are great Destroyers of young Trees at that Season, by eating off all their Bark, therefore you must carefully guard your Nursery against these Enemies.

The Ground, being inclosed, should be carefully trenched about 18 Inches, or 2 Feet deep, provided it will allow it; this should be done in *August* or *September*, that it

it may be ready to receive young Stocks at the Season for Planting, which is commonly in the Middle of *October*. In trenching the Ground, be very careful to cleanse it from the Roots of all noxious Weeds, as Couch Grass, Docks, &c. which, if left in the Ground, will get in among the Roots of the Trees, so as not to be got out, and will spread, and over-run the Ground, to the great Prejudice of your young Stocks.

Having dug the Ground, and the Season being come for Planting, level down the Trenches as equal as possible, and lay out the Ground into Quarters, proportionable to the Size thereof, and those Quarters may be laid out in Beds, for sowing Seeds, or the Stones of Fruit.

The best Sort of Stocks for Peaches, Nectarines, &c. are such as are raised from the Stones of the Muscle and white Pear Plum, but you should never plant Suckers of these (as some practise) for they seldom make so good Stocks, nor are ever well-rooted Plants; besides, they are very subject to produce great Quantities of Suckers from their Roots, which are troublesome in the Borders, or Walks of a Garden, and greatly injure the Tree, so that you should annually, or at least every other Year, sow a few Stones of each, that you may never be at a loss for Stocks.

For Pears, you should have such Stocks as have been raised from the Kernels of the Fruit where Perry hath been made, or else preserve the Seeds of some Sorts of Summer Pears, which generally shoot strong and vigorous, as the Cuisse Madame, Windsor, &c. but when this is intended, the Fruit should be suffered to hang upon the Trees till they drop, and afterward permitted to rot; then take out the Kernels, and put them in Sand, being careful to keep them from Vermin, and to place them where they may not be too damp, which will cause them to grow mouldy. These you should sow for Stocks early in the Spring, upon a Bed of good light fresh Earth, where they will come up in about six Weeks, and, if kept clear from Weeds, will be strong enough to transplant the *October* following. But for many Sorts of Summer and Autumn Pears, Quince Stocks are preferable to Free (*i. e.* Pear) Stocks; these are generally used for all the Sorts of soft-melting Pears, but they are not so good for the breaking Pears, being apt to render those Fruits which are grafted upon them stony; these are very often propagated from Suckers, which are generally produced in Plenty from the Roots of old Trees; but those are not near so good as Cuttings, or Layers, which always make better Roots, and are not so subject to produce Suckers as the other, which is a very desirable Quality, since these Suckers not only rob the Trees of Part of their Nourishment, but are very troublesome in a Garden.

Apples are grafted or budded on Stocks raised from Seeds taken from the Cyder Press, or upon Crab Stocks, the latter of which are esteemed for their Durableness, especially for large Standard Trees; these should be raised from Seeds, as the Pear Stock, and treated in the same Manner; for those procured from Suckers, &c. are not near so good; but the Paradise Stock hath been for some Years past greatly esteemed, it being of very humble Growth, causeth the Fruit Trees grafted or budded thereon to bear very soon, and they may be kept in small Compass; but these are only proper for

very small Gardens, or by Way of Curiosity, since the Trees thus raised are but of short Duration, and seldom grow to any Size to produce Fruit in Quantities, unless the Graft or Bud be buried in Planting so as to put forth Roots, and then they will be equal to Trees grafted upon Free Stocks, since they receive but small Advantage from the Stock.

For Cherries, you should make use of Stocks raised from the Stones of the common Black, or the wild Honey Cherry, both of which are strong free Growers, and produce the cleanest Stocks.

For Plums, you may use the Stones of most free-growing Sorts, which will also do very well for Apricots, these being not so difficult to take as Peaches or Nectarines; but (as I said before) these should not be raised from Suckers, but rather from Stones.

Some Persons recommend the Almond Stock for several Sorts of tender Peaches, upon which they will take much better than upon Plum Stocks; but these being tender in their Roots, and apt to shoot early in the Spring, and being of short Duration, are by many rejected; but such tender Sorts of Peaches which will not take upon Plum Stocks, should be budded upon Apricots, on which they will take very well, and all Sorts of Peaches planted on dry Soils, will continue much longer, and not be so subject to Blight, if they are upon Apricots; for it is observed, that upon such Soils where Peaches seldom do well, Apricots will thrive exceedingly, which may be owing to the Strength and Compactness of the Vessels in the Apricots, which render it more capable of assimilating, or drawing its Nourishment from the Plum Stock, which in dry Soils seldom afford it in great Plenty to the Bud; and the Peach Tree, being of a loose spongy Nature, is not so capable to draw its Nourishment therefrom, which occasions that Weakness so commonly observed in those Trees, when planted on a dry Soil; therefore it is the common Practice of the Nursery Gardeners, to bud the Plum Stocks either with Apricots, or some free growing Peach, and after these have grown a Year, they bud the tender Sorts of Peaches upon these Shoots, by which Method many Sorts succeed well, which in the common Way will not thrive, or scarce keep alive; and these the Gardeners term double worked Peaches.

Some People of late have budded and grafted Cherries on Stocks of the *Cornish*, and Morello Cherry, which, they say, will render the Trees more fruitful, and less luxuriant in Growth, so that they may be kept in less Compass; these Stocks having the same Effect on Cherries, as the Paradise Stock hath on Apples.

Having provided yourself with young Stocks of all these different Sorts, which should be raised in the Seminary the preceding Year, you should transplant them in *October*, (as was before directed) into the Nursery. The Distance which they should be planted, if designed for Standards, should be three Feet and a Half, or four Feet, Row from Row, and a Foot and a Half distant in the Rows; but if for Dwarfs, three Feet Row from Row, and one Foot in the Rows, will be sufficient.

In taking these Stocks out of the Seed Beds, you must raise the Ground with a Spade, in order to preserve the Roots as entire as possible; then with your Knife prune off all the very small Fibres, and if there are any

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which have a Tendency to root downright, such Roots should be shortened; having thus prepared the Plants, draw a Line across the Ground intended to be planted, and with your Spade open a Trench thereby exactly strait, into which you should place them at the Distance before-mentioned, setting them exactly upright; then put the Earth in close to them, filling up the Trench, and with your Foot press the Earth gently to their Roots, observing not to displace them so as to make the Rows crooked, which will render them unsightly; these Plants should by no Means be headed, or pruned at Top, which will weaken them, and cause them to produce lateral Branches, and thereby spoil them.

If the Winter proves very cold, it will be of great Service to your young Stocks, to lay some Mulch upon the Surface of the Ground near their Roots, which will prevent the Frost from penetrating the Ground, so as to hurt the tender Fibres, which were produced after planting; but be careful not to let it lie too thick near the Stems of the Plants, nor remain too long, lest the Moisture should be prevented from penetrating to the Roots of the Plants, which it often does, where there is not due Care taken to remove it as soon as the Frost is over.

In the Summer Season, always observe to hoe and destroy the Weeds, which, if permitted to remain in the Nursery, will greatly weaken and retard the Growth of your Stocks; and, the succeeding Years, observe to dig up the Ground every Spring between the Rows, which will loosen it so, that the Fibres may easily strike out on each Side, and the Weeds will thereby be destroyed; also observe, where any of the Stocks have shot out lateral Branches, to prune them off, that they may be encouraged to grow upright and smooth.

The 2d Year after planting, such of the Stocks as are designed for Dwarf Trees, will be fit to bud, but those which are designed for Standards, should be suffered to grow 5 or 6 Feet high before they are budded or grafted. The Manner of Budding and Grafting being fully described under their respective Heads, I shall not repeat them here, nor need I say any Thing more of treating these Trees after budding, that being also treated of under the several Articles of Fruits; I shall only add, that those Stocks, which were budded in the Summer, and have failed, may be grafted the following Spring, but Peaches and Nectarines never take well from Grafts, these should therefore be always budded.

The Ground you intend for the Flower Nursery, should be well situated to the Sun, but defended from strong Winds by Plantations of Trees, or Buildings, and the Soil light and dry, which must always be observed, especially where bulbous rooted Flowers, are designed to be planted; the Particulars of which are exhibited under the several Articles of Flowers.

In this Nursery should be planted the Offsets of all your bulbous rooted Flowers, where they are to remain until they become blowing Roots, when they should be removed into the Pleasure Garden, and planted either in Beds, or Borders, according to the Goodness of the Flowers, or the Management which they require.

You may also in this Ground, raise the several Sorts of bulbous rooted Flowers from Seed, by which Means new Varieties may be obtained, but most People are discouraged from setting about this Work, from the

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Length of Time before the Seedlings will come to flower: however, after a Person hath once begun, and constantly continued sowing every Year, after the Parcel first sown has flowered, the regular Succession of them coming annually to flower, will not render this Method so tedious as it at first appeared.

The seedling Auriculas, Polyanthus, Ranunculuses, Anemonies, Carnations, &c. should be raised in this Nursery, and preserved there until they have flowered, when you should mark all such as are worthy of being transplanted into the Flower Garden, which should be done in their proper Seasons; for it is not so well to have all these seedling Flowers exposed to View in the Flower Garden, because it always happens, that there are great Numbers of ordinary Flowers produced amongst them, unworthy of a place in the Pleasure Garden.

NUX AVELLANA. See Corylus.

NUX JUGLANS. See Juglans.

NUX VESICARIA. See Staphylodendron.

NYCTANTHES. Lin. Gen. Plant. 16. *Jasminum*. Raii. Meth. Plant. Arabian Jasmine.

The Characters are,

The Empalement of the Flower is cylindrical, permanent, and of one Leaf, cut into 8 acute Segments. The Flower is of the Salver Shape, of one Leaf, with a cylindrical Tube longer than the Empalement, cut into 8 Segments at the Top; which spread open. It hath 2 small Awl-shaped Stamina, situated in the Bottom of the Tube, terminated by erect Summits, and one roundish depressed Germen, supporting a single Style, the Length of the Tube, crowned by a bifid erect Stigma. The Germen afterward becomes a roundish Berry with 2 Cells, each containing a large roundish Seed.

The Species are,

1. NYCTANTHES caule volubili, foliis subovatis acutis. Hort. Upsul. 4. *Nyctantes* with a winding Stalk, and oval acute Leaves. This is the *Jasminum Arabicum*. Clus. Cur. 3. The Arabian Jasmine.

2. NYCTANTHES petiolis pedunculisque villosis. Lin. Sp. Plant. 6. *Nyctantes* with the Foot Stalks of the Leaves, and Flowers hairy. This is the *Jasminum Indicum bacciferum*, flore albo majore, noctu olente. Com. Indian Berry-bearing Jasmine, with a large white Flower smelling by Night.

The 1st Sort grows naturally in India, from whence it has been formerly brought to the Islands in America, where the Plants are cultivated for Ornament; this rises with a winding Stalk, to the Height of 10 or 12 Feet, sending out many small Branches, garnished with oval smooth Leaves, near 3 Inches long, and almost 2 broad, of a light green, standing opposite, on short Foot Stalks, which are hairy, ending in acute Points. The Flowers are produced at the End of the Branches, upon short Foot Stalks, each generally sustain three Flowers, the two lower being opposite, and the Middle one is longer; these have cylindrical Empalements, which are short, and are cut almost to the Bottom into 8 narrow Segments. The Tube of the Flower is narrow, about half an Inch long, and is cut at the Top into 8 obtuse Segments, which expand quite flat; they are of a pure white, and have a most agreeable Odour, somewhat like the Orange Flower, but sweeter; these Flowers, when fully blown, drop out of their Cups upon being shaken, and frequently fall in the Night, so that when the

the Plants are in full flower, the Place under them is often covered with Flowers in the Morning, which soon change to a purplish Colour. The Plants continue flowering great Part of the Year, when they are kept in a proper Temperature of Warmth.

The 2d Sort grows naturally in India, where it rises to the Height of a Tree, dividing into many Branches, garnished with large, oval, smooth Leaves, of a lucid green, with hairy Foot Stalks; these come out on every Side the Branches, without Order. The Flowers are produced on the Side of the Branches, from the Wings of the Leaves, upon long hairy Foot Stalks, each sustaining 7 or 8 Flowers, of a pure white and very fragrant, but have longer Tubes than those of the former Sort. The Flowers open in the Evening, and drop off in the Morning, which has occasioned some to give it the Title of *Arbor Tristis*, or the Sorrowful Tree; this is very rare in Europe at present.

The Plants of the 1st Sort are frequently brought from Italy, by the Italian Gardeners, who bring Orange Trees here for Sale; but those Plants are always grafted upon Stocks of the common Jasmine, which do not keep Pace in their Growth with the Graft, so become very unsightly, when the Plants are grown to any Size; besides, the Stocks are very subject to shoot from the Bottom, and if these Shoots are not constantly rubbed off, they will draw the Nourishment from the Graft, and starve it; therefore the best Method to obtain the Plants, is to propagate them by Layers, or Cuttings; the former is the surest Method, for unless the Cuttings are very carefully managed, they will not take Root; and as the Stalks of this Sort are pliable, they may be easily brought down, and laid in Pots filled with a soft loamy Soil, which should be plunged into a hot Bed of Tan; if the Branches are laid down in the Spring, and carefully watered, they will put out Roots by Autumn, when they may be cut from the old Plants, and each transplanted into a separate small Pot, and then plunged into the Tan Bed, where they should be shaded from the Sun until they have taken new Root.

If these Plants are propagated by Cuttings, they should be planted in April, into Pots filled with the before-mentioned Earth, and plunged into a moderate hot Bed of Tanners Bark. The Pots should be large, and there may be 10 or 12 Cuttings planted in each; if these Pots are closely covered with Bell, or Hand Glasses, to exclude the Air, it will greatly promote their taking Root; they must also be shaded from the Sun in the Heat of the Day, and gently refreshed with Water when the Earth is dry; with this Management the Cuttings will have taken Root by August, when they may be transplanted into separate Pots, and treated as the Layers.

These Plants may be preserved in a moderate Degree of Warmth, but if they are plunged in the Tan Bed of the Bark Stove, they will thrive much better, and produce a greater Quantity of Flowers; and as the Leaves continue all the Year, the Plants will make a fine Appearance in the Stove at all Seasons, and produce Flowers great Part of the Year.

The 2d Sort requires the same Treatment, but is much more difficult to propagate, so is very rarely found in the European Gardens; there was two or three of these Plants brought from Florence, a few Years

since, but they were put into the Hands of unskilful Persons, so were lost.

NYMPHÆA. *Tourn. Inst. R. H. 260. Lin. Gen. Plant. 579.* The Water Lily; in French, *Nenufar*.

The Characters are,

The Empalement of the Flower is composed of four or five coloured Leaves, and is permanent. The Flower hath many Petals, which are smaller than the Empalement, sitting on the Side of the Germen, for the most Part in a single Series. It hath a great Number of short plain incurved Stamina, with oblong Summits, like Threads, growing to their Borders. It hath a large oval Germen, but no Style, with an orbicular, plain, Target-shaped Stigma, sitting close, whose Border is crenated, and is permanent. The Germen afterward becomes a hard, oval, fleshy Fruit, with a rude narrow Neck, crowned at the Top, and divided into ten or fifteen Cells full of Pulp, with many roundish Seeds.

The Species are,

1. *NYMPHÆA calyce magno pentaphyllo. Flor. Lap. 218.* Water Lily with a large five-leaved Empalement. This is the *Nymphæa lutea major. C. B. P. 193.* Greater yellow Water Lily.

2. *NYMPHÆA foliis cordatis integerrimis, calyce quadrifido. Lin. Sp. Plant. 510.* Water Lily with Heart-shaped entire Leaves, and a four-pointed Empalement. This is the *Nymphæa alba major. C. B. P. 193.* Greater white Water Lily.

There are some other Species of this Genus, which are Natives of warm Countries, but as they cannot without great Difficulty be cultivated here, I shall not enumerate them; for unless there is a Contrivance for standing Water in the Stove, in which they may be planted, they will not grow, and such a Place would be injurious to most other Plants in the Stove, by occasioning Damps, so that unless a Stove was contrived on Purpose for some of these aquatick Plants, it would be imprudent to attempt their Cultivation.

The two Sorts here mentioned grow naturally in standing Waters in many Parts of England; they have large Roots, which are fastened in the Ground, from which arise the Stalks to the Surface of the Water, where the Leaves expand and float; they are large and roundish, those of the 2d Sort are Heart-shaped. The Flowers arise between the Leaves, and swim upon the Surface of the Water. The white Sort has a faint sweet Scent; these appear in July, and are succeeded by large roundish Seed Vessels, filled with shining black Seeds, which ripen toward the End of August, when they sink to the Bottom of the Water.

The best Method to propagate these Plants is, to procure some of their Seed Vessels just as they are ripe, and ready to open; these should be thrown into Canals, or large Ditches of standing Water, where the Seeds will sink to the Bottom and the following Spring the Plants will appear floating upon the Surface of the Water, and in June and July will produce their beautiful large Flowers. When they are once fixed to the Place, they will multiply exceedingly, so as to cover the whole Surface of the Water in a few Years.

In some small Gardens I have seen these Plants cultivated in large Troughs of Water, where they have flourished very well, and have annually produced great Quantities of Flowers; but as the Expence of these Troughs

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Troughs is considerable (their Insides requiring to be lined with Lead, to preserve them), there are few People who care to beat that Charge.

NYSSA. Flor. Virg. 121. Lin. Gen. Plant. 1028. The Tupelo Tree.

The Characters are,

It has hermaphrodite and male Flowers on the same Plant; the male Flowers have an open spreading Empalement cut into 5 Parts. It has no Petal, but has 10 Awl-shaped Stamina with Twin Summits as long as the Stamina; the hermaphrodite Flowers have Empalements like the male, which sit upon the Germen; they have no Petals, but have 5 Awl-shaped erect Stamina terminated by single Summits. The oval Germen, situated under the Flower, supports an Awl-shaped incurved Style crowned by an acute Stigma. The Germen becomes an oval Berry of one Cell, inclosing an oval acute-pointed Nut with rough angular, irregular Furrows.

The Species are,

1. NYSSA foliis integerrimis. H. C. 462. Tupelo Tree with entire Leaves. This is the *Cynoxylon Americanum*, folio crassiusculo molli & tenaci. Pluk. Phyt. American Cynoxylon with a thick, soft, tenacious Leaf.

2. NYSSA foliis acute dentatis. Tupelo, with Leaves acutely indented, commonly called Water Tupelo. This is the *Arbor in aqua nascentis*, foliis latis acuminatis dentatis, fructu Eleagni majore. Catesb. Carol. p. 60.

The 1st Sort grows naturally in Virginia and several other Parts of North America, where it rises with a pretty strong upright Stalk near 20 Feet high, dividing at the Top into several Branches, garnished with pretty thick, soft, Spear-shaped Leaves placed alternately; these are entire, and of a light green Colour. The Flowers come out from the Wings of the Stalk, upon pretty long Foot Stalks; they have a green Empalement without Petals. Some of them are male, which have 10 Stamina and are barren; others are hermaphrodite having 5 Stamina, and a longer Style arising from the Germen which is situated under the Flower; these are succeeded by oval Berries about the Size of small Olives, inclosing a Nut of the same Form.

The 2d Sort grows naturally in Carolina in shallow Parts of Rivers and Swamps; it has a pretty large Trunk, from which come out many Branches toward the Top, garnished with oblong, acute-pointed Leaves about 3 Inches long, and an Inch broad toward their Base; they are acutely indented on their Borders, and of a light green

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Colour, standing on long Foot Stalks without Order. The Flowers come out from the Wings of the Stalk on very long Foot Stalks; they have no Petals, but have a green Empalement, and are some male, and others hermaphrodite as the 1st. The hermaphrodite Flowers are succeeded by oblong oval Berries, about the Size and Shape of French Olives, inclosing a rough, hard-shelled Nut of the same Form.

Some of these Plants have been introduced of late into the English Gardens, but there are few Places where they have made much Progress; they may be propagated by Seeds, but these must be procured from the Places where they grow naturally, and should be put into the Ground as soon as they arrive, for they always lie a Year before the Plants come up. The best Way is to sow them in Pots filled with light loamy Earth placing them where they may have only the Morning Sun; during the first Summer the Pots must be kept clean from Weeds; and in dry Weather duly watered. In Autumn the Pots should be plunged into the Ground, and if the Winter should prove severe, they should be covered with old Tan, Pease Haulm, or other light Covering, to prevent the Frost from penetrating the Ground. The following Spring the Pots should be plunged in a moderate hot Bed which may be hooped over, and covered with Mats, observing constantly to keep the Earth moist. This will bring up the Plants by the Beginning of May; these must be gradually hardened to bear the open Air, and during the following Summer, the Pots should be again plunged into an East Border, and in dry Weather duly watered. In Autumn they should be removed into a Frame, where they may be screened from Frost; but in mild Weather exposed to the open Air. The Spring following, before the Plants begin to shoot, they should be parted carefully and each planted in a small Pot filled with loamy Earth, and if they are plunged into a moderate hot Bed, it will forward their putting out new Roots, then they may be plunged in an East Border, and treated the same Way as in the former Summer, and in Winter sheltered again under a Frame. The Spring following such of the Plants, as have made the greatest Progress, may be turned out of the Pots, and planted in a loamy moist Soil, in a sheltered Situation, where they will endure the cold of this Climate; but unless the Ground is moist they make very little Progress.

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AK. See Quercus.

OBELISCOTHECA. See Rudbeckia.

OCHRUS. See Pifum.

OCULUS CHRISTI. See Horminum sylvestre.

OCYMUM. Tourn. Inst. R. H. 203. Tab. 96. Lin. Gen. Plant. 651. Basil; in French, Basilic.

The Characters are,

The Empalement of the Flower is short, permanent, of one Leaf, divided into 2 Lips; the upper Lip is plain, bifid, and Heart-shaped; the under is cut into 4 acute

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Segments. The Flower is of the Lip Kind, of one Petal inverted. It has a short spreading Tube; the rising Lip is broad, and cut into 4 obtuse equal Parts; the reflexed Lip is long, narrow, and fawed. It hath 4 Stamina in the lower Lip, deflexed, two of which are a little longer than the other, terminated by Halfmoon-shaped Summits. The Germen is divided into 4 Parts, supporting a slender Style, situated with the Stamina, crowned by a bifid Stigma. The Germen become 4 naked Seeds inclosed in the Empalement.

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The Species are,

1. *OCYUM foliis ovatis glabris, calycibus ciliatis.* Hort. Cliff. 315. Basil with oval smooth Leaves, and hairy Empalements. This is the *Ocymum caryophyllatum majus*. C. B. P. 226. Greater Clove-scented, or common Basil.

2. *OCYUM foliis ovatis integerrimis.* Hort. Upsal. 169. Basil with oval entire Leaves. This is the *Ocymum minimum*. C. B. P. 226. The least Basil, commonly called Bush Basil.

3. *OCYUM hirsutum, foliis ovato-lanceolatis acuminatis dentatis.* Hairy Basil with oval Spear-shaped Leaves, which are indented, and end in acute Points. This is the *Ocymum medium vulgatus* & *nigrum*. J. B. 3. p. 2. 247. Common middle black Basil.

4. *OCYUM foliis ovato-oblongis serratis, bracteis cordatis reflexis concavis.* Lin. Sp. Plant. 597. Basil with oval, oblong, sawed Leaves, and Heart-shaped, concave, reflexed Bractææ. This is the *Ocymum minus Chinense*, *odoratissimum flore albo*. Boerb. Ind. alt. Smaller China Basil of a most sweet Odour, and having a white Flower.

5. *OCYUM foliis lanceolatis subtus incanis, petiolis longissimis villosis floribus pedunculatis.* Basil with Spear-shaped Leaves, which are hoary on their under Side, and very long hairy Foot Stalks, having Flowers. This is the *Ocymum Campechianum odoratissimum*. Houst. Mss. The sweetest scented Basil of *Camprachy*.

6. *OCYUM foliis lineari-lanceolatis serratis.* Flor. Zeyl. 229. Basil with linear Spear-shaped sawed Leaves.

7. *OCYUM racemis secundis lateralibus, caule erecto.* Lin. Sp. Pl. 597. Basil with fruitful Spikes of Flowers on the Side of the Stalk, which is erect. *Ocymum Zeylanicum*, *perenne, odoratissimum latifolium*. Burn. Zeyl. Sweet-scented perennial Basil of *Ceylon*, with broad Leaves.

The three first Sorts grow naturally in *India* and *Persia*; of these there is a great Variety, which differ in the Size, Shape, and Colour of their Leaves, as also in their Odour; but as these Differences are accidental, I have not enumerated them, being convinced from repeated Experiments, that the Seeds of one Plant will produce many Varieties.

The 1st Sort rises with a branching Stalk a Foot and a Half high; the Leaves are large, oval, and smooth; the Stalks hairy, and four cornered; the Leaves are placed by Pairs opposite, and the Branches also come out in the same Manner; the Stalk is terminated by a whorled Spike of Flowers, which is five or six Inches long, and the Branches are also terminated by short Spikes of Flowers of the same Sort; the whole Plant has a strong Scent of Cloves.

Of this there are the following Varieties:

1. The fringed leaved-Basil with Purple Leaves.

2. The green fringed-leaved Basil.

3. The green Basil with studded Leaves.

4. The large leaved Basil.

The 2d Sort is a low bushy Plant, which seldom rises more than six Inches high, spreading out into Branches from the Bottom, forming an orbicular Head; the Leaves are small, oval, and smooth, standing opposite on short Foot Stalks. The Flowers are produced in Whorls toward the Top of the Branches; they are smaller than those of the former Sort, and are seldom succeeded by ripe Seeds in *England*.

Of this there are some Varieties, as

1. The smallest Basil with black purple Leaves.

2. The smallest Basil with variable Leaves.

The 3d Sort is the common Basil used in Medicine; and also in the Kitchen, particularly by *French Cooks*, who make great use of it in their Soups and Sauces. This rises about 10 Inches high, sending out Branches by Pairs opposite, from the Bottom; the Stalks and Branches are four cornered; the Leaves are oval, Spear-shaped, ending in acute Points, and indented on their Edges; the whole Plant is hairy, and has a strong Scent of Cloves, too powerful for most Persons, but to some is very agreeable: The whole Plant is an Ingredient in the compound Briony Water.

There are some Varieties of this Species, viz.

1. Common Basil with very dark green Leaves, and a Violet-coloured Flower.

2. Curled-leaved Basil with short Spikes of Flowers.

3. Narrow-leaved Basil smelling like Fennel.

4. Middle Basil with a Scent of Citron.

5. Basil with studded Leaves.

6. Basil with Leaves of three Colours.

The 4th Sort grows naturally in *India*; this rises with a branching Stalk, a Foot and a Half high, which is taper, and of a purplish Colour; the Leaves are short and hairy; they are of an oval oblong Figure, ending in obtuse Points, sawed on their Edges, and stand upon pretty long Foot Stalks. The Stalks are terminated by 3 Spikes of Flowers, that in the Middle being longer than the other two; the Spikes are long and narrow, and the Flowers have short Foot Stalks; under each Whorl of Flowers, are two small Leaves placed opposite, which are Heart-shaped concave, and reflexed. The Flowers are small, and in some Plants of a purplish Colour, but in general they are white; their Empalements are smooth, and cut into 5 Parts at the Top; the Style is longer than the Petal, and the whole Plant has a strong, sweet, aromatick Odour.

The 5th Sort rises with an upright Stalk near 2 Feet high, sending out sometimes 2 and at others 4 Branches toward the Top, opposite, garnished with Spear-shaped Leaves, about 3 Inches long and one broad in the Middle, lessening at both Ends to a Point; their Foot Stalks are 2 Inches long, and hairy. The Flowers grow in whorled Spikes at the Top of the Stalks, and stand upon Foot Stalks, each sustaining 3 Flowers about the Size of those of the common Basil, and are white; the whole Plant has a strong aromatick Odour.

The 6th Sort grows naturally in the Island of *Ceylon*; this rises with a branching Stalk about a Foot high, garnished with linear Spear-shaped Leaves which are sawed. The Flowers grow in whorled Spikes at the Top of the Stalks, which are like those of the common Basil; the whole Plant has an Odour like Anise Seeds.

The 7th Sort grows naturally in the Island of *Ceylon*; this rises with a square Stalk 2 Feet high, which is hairy, and divides into 3 Branches at Top; the lower Leaves are roundish, ending in Points; they are hairy, and creased on their Edges, standing on slender Foot Stalks; the Leaves on the Stalks are narrower and shorter, and have Foot Stalks an Inch long; the Stalks are terminated by 3 Spikes of Flowers in Whorls, that in the Middle being the longest. The Flowers are reflexed and hang down.

downward, they are white, and larger than those of the common Sort. This Plant has less Odour than the other Sorts.

These Plants, being most of them annual, are propagated from Seeds, which should be sown in March, upon a moderate hot Bed; and when the Plants are come up, they should be transplanted into another moderate hot Bed, observing to water and shade them until they have taken Root; after which they should have Plenty of Air in mild Weather, otherwise they will draw up very weak; you must also water them frequently, for they love Moisture. In May they should be taken up with a Ball of Earth to their Roots, and transplanted either into Pots or Borders, observing to shade them until they have taken Root; after which they require no farther Care, but to clear them from Weeds, and refresh them with Water in dry Weather. Though these Plants are only propagated from Seeds, yet if any particular Sort should arise from Seeds, which you are desirous to increase, you may take off Cuttings any Time in May, and plant them on a moderate hot Bed, observing to water and shade them for about ten Days; in which Time they will take Root, and in three Weeks be fit to remove, into Pots or Borders, with the seedling Plants. In September these Plants will perfect their Seeds, when those Sorts which appear the most distinct, should have their Seeds preserved separate, for sowing the following Spring.

The Seeds of these Plants are usually brought from the South of France or Italy every Spring, because they seldom ripen in this Country in the open Air. But whoever is curious to preserve the Seeds of any of the Varieties, should place them in an airy Glass Case or Stove in Autump, when the Weather begins to be cold or wet; and by supplying them with Water, and letting them have free Air every Day in mild Weather, they will perfect Seeds very well in this Country.

The 6th Sort is more tender than any of the other. This was discovered growing wild at Compeachy, by Dr. Houfson, who sent the Seeds to England. This should be sown on a hot Bed early in the Spring, and when the Plants come up, they should be transplanted on another very temperate hot Bed, to bring them forward; when they have obtained Strength, they should be each transplanted into a separate Pot, and placed either in the Stove, or on a moderate hot Bed, where they may have a large Share of Air in warm Weather; If sheltered from Cold and Wet, the Plants will perfect Seeds very well in England.

The 7th Sort grows to be shrubby, and if placed in a moderate Warmth in Winter, may be preserved two Years; this will ripen Seeds the first Year, if the Plants are brought forward in Spring; but if this should fail, the Plants may be placed in the Stove, where they may be kept through the Winter, and the following Season will perfect their Seeds. In Summer the Plants should be placed in the open Air in a sheltered Situation, and in warm Weather should have Plenty of Water.

The Odour of these Plants is too strong for most Persons, especially in a Room, or if near them, for which Reason they should not be placed too near the Habitation, because if they are in any Quantity, the Odour will

extend at Times to most of the Apartments, when the Windows are open.

CENANTHE. *Tourn. Inst. R. H. 312. Tab. 166. Lin. Gen. Plant. 314.* [*Oenanthe*, of *Oen*, a Vine, and *Anthos*, a Flower. The Ancients called any Plant *Oenanthe* that flowered at the same Time with the Vine, or whose Flowers had the same Odour.] Water Dropwort.

The Characters are,

It is a Plant with an umbelliferous Flower; the principal Umbel has but few Rays, but the particular Umbels have many short ones. The principal Involucrum is composed of many single Leaves, which are shorter than the Umbel, the smaller Umbels have many small Leaves; the Rays of the principal Umbel are difform. Those Flowers in the Disk are hermaphrodite, and are composed of five Heart-shaped inflexed Petals, which are almost equal; those of the Rays are hermaphrodite, and have five large unequal Petals which are bifid; they have five single Stamina terminated by roundish Summits. The Germen is situated under the Flower, supporting two Awl-shaped permanent Styles, crowned by obtuse Stigmas. The Germen becomes an oval Fruit, divided in two Parts, containing two almost oval Seeds, convex on one Side and plain on the other.

The Species are,

1. *CENANTHE foliis omnibus multifidis obtusis subaequalibus.* *Hort. Cliff. 99.* Water Dropwort, whose Leaves all end in many obtuse Points, and are almost equal. This is the *Oenanthe succo viroso, cicutae facie lobellii* *J. B. 3. p. 2. 193.* Hemlock Dropwort.

2. *CENANTHE stolonifera, foliis caulinis pinnatis filiformibus fistulosis.* *Lin Sp. Plant. 254.* Water Dropwort with slender fistular winged Leaves growing on the Stalks. *Oenanthe aquatica. C. B. P.* Water Dropwort.

3. *CENANTHE foliolis radicalibus ovatis incis, caulinis integris linearibus longissimis simplicioribus.* *Hort. Cliff. 99.* Water Dropwort whose lower Leaves are oval and cut, but those on the Stalks entire, single, narrow, and very long. This is the *Oenanthe apii folio. C. B. P. 162.* Water Dropwort with a Smallage Leaf.

4. *OENANTHE umbellularum pedunculis marginalibus longioribus ramosis masculis.* *Hort. Upsal. 63.* Water Dropwort whose Foot Stalks on the Borders of the Umbels are longer, branching, and bear male Flowers. This is the *Oenanthe prolifera Apula. C. B. P. 163.* Childing Water Dropwort of Apulia.

5. *OENANTHE fructibus globosis.* *H. Cliff. 99.* Water Dropwort with globular Fruit. This is the *Oenanthe Lusitanica, semine crassiore globoso. Tourn. Inst. Portugal* Water Dropwort, with a thicker globular Seed.

The 1st of those here mentioned, is very common by the Sides of the Thames, also by the Sides of large Ditches and Rivers in divers Parts of England: This Plant commonly grows 4 or 5 Feet high with strong jointed Stalks, which, being broken, emit a yellowish fetid Juice; the Leaves are somewhat like those of the common Hemlock, but of a lighter green Colour: The Roots divide into 4 or 5 large taper ones, which, when separated, have some Resemblance to Parsneps; for which some ignorant Persons have boiled them, whereby themselves and Family have been poisoned.

This Plant is one of the most poisonous we know; the Juice which is at first like Milk, turns afterward to a Saffron Colour: If a Person should swallow ever so little

little of this Juice, it will so contract every Part it touches, that there will immediately follow a terrible Inflammation and Gangrene: And there has not yet been found any Antidote against it; for which Reason, we ought to be very careful to know this Plant, in order to avoid it, for Fear we should take it for any other like it, which would certainly prove fatal.

The poisonous Quality of this Plant, hath led some Persons to believe it to be the *Cicuta* of the Ancients; but according to *Wepfer*, the *Sium alterum olusatris facie* of *Lobel*, is what the Ancients called *Cicuta*, as may be seen at large in *Wepfer's* Book *De Cicuta*.

The 2d Sort is common in moist Soils, and by the Sides of Rivers in England: This is not supposed to be near so strong as the 1st, but is of a poisonous Quality.

All the Sorts of these Plants naturally grow in moist Places, so that whoever hath a Mind to cultivate them, should sow their Seeds soon after they are ripe in Autumn, upon a moist Soil, where they will come up, and thrive exceedingly the following Summer, and require no farther Care but to clear them from Weeds.

CENOTHERA. *Ljn. Gen. Plant.* 424. *Onagra.* *Tourn. Inst. R. H.* 302. *Tab.* 156. Tree Primrose.

The Characters are,

The Empalement of the Flower is of one Leaf, having a long cylindrical Tube, cut into 4 acute Segments at the Brim, which turn backward. The Flower has 4 Heart-shaped Petals, inserted Lengthways in the Divisions of the Empalement. It hath 8 Awl-shaped incurved Stamens, inserted in the Tube of the Empalement, and terminated by oblong prostrate Summits. The cylindrical Germen is situated under the Tube of the Empalement, supporting a slender Style crowned by a thick quadrifid, obtuse, reflexed Stigma. The Germen becomes a 4 cornered cylindrical Capsule, having 4 Cells filled with small angular Seeds.

The Species are,

1. *CENOTHERA foliis ovato-lanceolatis.* *Vir. Cliff.* 33. Tree Primrose, with plain, oval, Spear-shaped Leaves. This is the *Onagra latifolia.* *Tourn. Inst.* 302. Broad-leaved Tree Primrose.

2. *CENOTHERA foliis lanceolatis dentatis, caule hispido.* Tree Primrose with Spear-shaped indented Leaves, and a prickly Stalk. This is the *Onagra angustifolia, caule rubro, flore minore.* *Tourn. Inst.* Narrow-leaved Tree Primrose, with a red Stalk and a smaller Flower.

3. *CENOTHERA foliis lanceolatis planis, caule glabro.* Tree Primrose with plain Spear-shaped Leaves, and a smooth Stalk. This is the *Onagra angustifolia.* *Tourn. Inst.* 302. Narrow-leaved Tree Primrose.

4. *CENOTHERA foliis lanceolatis undulatis.* *Vir. Cliff.* 33. Tree Primrose, with waved Spear-shaped Leaves. This is the *Onagra Bonariensis villosa, flore mutabili.* *Hort. Elth.* 297. Hairy Tree Primrose of *Buenos Ayres*, with a changeable Flower.

5. *CENOTHERA foliis radicalibus ovatis, caulinis lanceolatis obtusis, capsulis ovatis sulcatis.* *Tab.* 188. Tree Primrose with oval Leaves at the Root, those on the Stalks Spear-shaped and blunt-pointed, and oval furrowed Seed Vessels.

The other Species which have been formerly placed in this Genus, are now under *Jussiaea* and *Ludwigia*, to which the Reader is desired to turn.

The three first Sorts grow naturally in *Virginia*, and

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other Parts of *North America*, from whence their Seeds were brought to *Europe* in the Beginning of the 16th Century; but they are now so common in many Parts of *Europe*, as to be taken for Natives. The 1st hath a long thick taper Root, which runs deep into the Ground, from which arise many oblong Leaves which spread flat on the Ground, between these the Stalk comes out, and rises 3 or 4 Feet high; the Stalk is of a pale green Colour, a little hairy, and about the Thickness of a Finger, full of Pith; this is garnished with long narrow Leaves set close to the Stalk, without Order. The Flowers are produced all along the Stalk from the Wings of the Leaves, the Germen sitting close to the Stalk, from the Top of which arises the Tube of the Flower, which is narrow, more than 2 Inches long; at the Top is the Empalement, which is cut into 4 acute Segments, reflexed downward. The Petal of the Flower is cut into 4 large obtuse Segments, which in the Evening are expanded quite flat, but are shut in the Day; these are of a bright yellow Colour. From the Flower opening in the Evening, many Persons call it the Night Primrose. The Plants begin to flower about *Midsummer*, and as the Stalks advance in Height other Flowers are produced, whereby there is a Succession on the same Plant till Autumn.

The 2d Sort hath red Stalks, set with rough Protuberances; it does not rise so high as the first, the Leaves are narrower, and the Flowers smaller.

The 3d Sort differs from the first, in having shorter Stalks, narrower Leaves, and smaller Flowers; and from the second, in having smooth Stalks, which are of a pale green Colour. These Differences are permanent, so they are undoubtedly different Species.

The 4th Sort grows naturally at *Buenos Ayres*; this hath a shrubby Stalk more than 2 Feet high, hairy, and garnished with narrow Spear-shaped Leaves ending in acute Points; these are hairy and sit close to the Stalks, being a little waved on their Edges. The Flowers come out from the Wings of the Leaves along the Stalks, like the other Sorts; they are first of a pale yellow, but as they decay change to an Orange Colour; they are smaller than either of the former Sorts, and expand only in the Evening; the Seed Vessels are slender, taper, and hairy. This flowers at the same Time.

The 5th Sort grows naturally in *Canada*, from whence the Seeds were brought to *Paris* a few Years past. This is a perennial Plant, the Root is fibrous; the lower Leaves are oval and small, sitting close to the Ground; the Stalk is slender, near a Foot high, and is garnished with small Spear-shaped Leaves, of a light green ending in blunt Points, sitting close to the Stalks. The Flowers come out from the Wings of the Leaves like the other Species; these are small, of a bright yellow Colour, and appear at the same Time as the former, and are succeeded by short, oval, furrowed Seed Vessels, filled with small Seeds.

The three first Sorts are very hardy, and if once brought into a Garden, and the Seeds permitted to scatter, there will be a Supply of Plants without any Care. They are all of them biennial, and perish after they have perfected their Seeds. The Seeds of these Plants should be sown in Autumn, for those which are sown in Spring seldom rise the same Year; when the Plants come

P

up, they should be thinned and kept clean from Weeds, which is all the Care they require till Autumn, when they should be transplanted to the Places where they are designed to flower; as the Roots of these Plants strike deep in the Ground, Care should be taken not to cut or break them in removing. They will thrive in almost any Soil or Situation, and flower in London in small Gardens, better than most other Plants.

The 4th Sort is now common in the English Gardens, for if the Seeds are permitted to scatter, the Plants will rise in Spring, and require no Care but to keep them clean from Weeds, and thin them where they grow too close. If these Plants are kept in Pots, and placed in a Greenhouse in Autumn, they will live through the Winter; but as they produce Flowers and Seeds in the open Air, the Plants are seldom preserved longer.

The 5th Sort is perennial, and may be propagated either by parting the Roots, or by Seeds: the best Time for doing the former is in Spring; but if they are propagated by Seeds, they should be sown in Autumn; and the surest Way is to sow them in Pots, and place them under a hot Bed Frame in Winter; in Spring the Plants will appear, and when they are fit to remove, a few of them may be planted in small Pots, to be sheltered under a common Frame in the Winter; and the others may be planted in a sheltered Border, where they will endure the Cold of our ordinary Winters very well, and the following Summer will produce Flowers and Seeds in Plenty, so there will be little Occasion for parting their Roots, because the seedling Plants will be much stronger and flower better, than those propagated by Offsets.

OLDENLANDIA. Plum. Nov. Gen. 42. Tab. 36. Lin. Gen. Plant. 143.

The Characters are,

The Empalement of the Flower is permanent, sitting upon the Germen, and cut into 5 Parts. The Flower has 4 oval Petals which spread open and are double the Length of the Empalement, and four Stamina terminated by small Summits. It hath a roundish Germen situated under the Flower, supporting a single Style, crowned by an indented Stigma. The Germen afterward turns to a globular Capsule with two Cells, filled with small Seeds.

We have but one Species of this Plant, which is,

OLDENLANDIA pedunculis multifloris, foliis linearilanceolatis. Lin. Sp. Plant. 119. Oldenlandia with many Flowers on a Foot Stalk, and linear Spear-shaped Leaves. This is the Oldenlandia bumilis hyssopifolia. Plum. N. G. Dwarf Oldenlandia with a Hyssop Leaf.

This Plant was discovered in America by Father Plumier, who gave this Name to it in Honour of Henry Bernard Oldenland, a very curious Botanist.

The Seeds of this were sent to England by Mr. Millar, who gathered them in Jamaica. It is a low annual Plant, which seldom rises above 3 or 4 Inches high, and divides into many Branches, which spread near the Ground. These Branches are furnished with long narrow Leaves, placed by Pairs opposite to each other. From the Wings of the Leaves arises the Flower Stalk, which grows about an Inch, or a little more in Length, and divides into 3 or 4 smaller Foot Stalks; on the Top of each of these, stands one small white Flower.

The Seeds of this Plant should be sown early in the Spring on a hot Bed, and when the Plants are come up,

they should be transplanted on another hot Bed, or into small Pots, and plunged in a moderate hot Bed of Tanners Bark, observing to water and shade them until they have taken Root, after which Time, they must have a large Share of free Air in warm Weather, and must be frequently refreshed with Water. With this Management the Plants will flower in June, and their Seeds will ripen soon after, so that the Seeds must be gathered from Time to Time as they ripen; for as the Branches grow larger, so there will be fresh Flowers produced until Autumn, when the Plants will perish; but if the Seeds are permitted to scatter in the Pots, the Plants will soon after appear, which will live through the Winter, provided they are placed in the Stove, and will flower early the following Spring.

OLEA. Tourn. Inst. R. H. 598. Tab. 370. Lin. Gen. Plant. 20. [of 'Ελαια,] the Olive; in French, Olivier.

The Characters are,

It has a small tubulous Empalement of one Leaf, cut into four Segments at the Top. The Flower consists of one Petal which is tubulous, and cut at the Brim into four Segments which spread open. It has two short Stamina terminated by erect Summits, and a roundish Germen supporting a short single Style, crowned by a thick bifid Stigma. The Germen afterward turns to an oval smooth Fruit (or Berry) with one Cell, inclosing an oblong oval Nut.

The Species are,

1. OLEA foliis linearilanceolatis subtus incanis. Olive with linear Spear-shaped Leaves, which are hoary on their under Side. This is the Olea fructu oblongo minori. Tourn. Inst. R. H. 599. Olive with a smaller oblong Fruit, commonly called Provence Olive.

2. OLEA foliis lanceolatis, fructu ovato. Olive with Spear-shaped Leaves, and an Egg-shaped Fruit. This is the Olea fructu maximo. Tourn. Inst. R. H. 599. Olive with the largest Fruit, called the Spanish Olive.

3. OLEA foliis lanceolatis obtusis rigidis, subtus incanis. Olive with Spear-shaped, obtuse, rigid Leaves, which are hoary on their under Side. This is the Olea sylvestris, folio duro, subtus incano. C. B. P. 472. The wild Olive with a hard Leaf, and hoary on its under Side.

4. OLEA foliis lanceolatis lucidis, ramis teretibus. Olive with Spear-shaped shining Leaves, and taper Branches. This is the Olea Afra, folio longo, lato, supra atroviridi splendente, infra pallide viridi. Boerb. Ind. alt. 2. 218. African Olive, with a long, broad, shining Leaf of a greenish black above, and pale on its under Side.

5. OLEA foliis ovatis rigidis sessilibus. Olive with oval stiff Leaves, sitting close to the Branches. This is the Olea Afra, folio buxi crasso atroviridi, lucido, cortice albo scabro. Boerb. Ind. alt. 2. 218. African Olive, with a thick, dark, shining Box Leaf, and a rough white Bark, commonly called Box-leaved Olive.

The 1st Sort is what the Inhabitants of the South of France chiefly cultivate, because from this Species the best Oil is made, which is a great Branch of Trade in Provence and Languedoc; and it is the Fruit of this Sort, which is most esteemed when pickled: Of this there are some Varieties; the first is called Olive Picholine; there is another with dark green Fruit, one with white Fruit, and another with smaller and rounder Fruit; but as these are supposed to be only accidental Varieties from the same Seeds, I have not enumerated them.

The

The Olive seldom rises to be a large Tree, and is rarely seen with a single Stem, but frequently two or three Stems rise from the same Root; these grow from 20 to 30 Feet high, putting out Branches from their Sides almost their whole Length, which are covered with a gray Bark, and garnished with stiff Leaves about two Inches and a Half long, and half an Inch broad in the Middle, gradually diminishing to both Ends; they are of a lively green on their upper Side, and hoary on their under, standing by Pairs opposite. The Flowers are produced in small Bunches from the Wings of the Leaves, they are small, white, and have short Tubes, spreading open at the Top; these are succeeded by oval Fruit, which, in warm Countries, ripen in Autumn.

The 2d Sort is chiefly cultivated in *Spain*, where the Trees grow to a much larger Size than the former Sort; the Leaves are much larger, and not so white on their under Side; the Fruit is near twice the Size of those of the *Provence* Olive, but are of a strong rank Flavour, and the Oil made from these, is too strong for most *English* Palates.

The 3d Sort is the wild Olive, which grows naturally in Woods, in the South of *France*, *Spain*, and *Italy*, so is never cultivated; the Leaves of this Sort are much shorter and stiffer than those of the other; the Branches are frequently armed with Thorns, and the Fruit is small and of no Value.

The 4th and 5th Sorts grow naturally at the *Cape of Good Hope*; the 4th rises to the Height of the first to which it bears some Resemblance, but the Bark is rougher; the Leaves are not so long, and are of a lucid green on their upper Side; but as this does not produce Fruit here I can give no Account of it.

The 5th Sort is of humbler Growth, seldom rising more than 4 or 5 Feet high, sending out Branches from the Root upward, forming a bushy Shrub; the Branches are taper, and covered with a gray Bark; the Leaves are oval, very stiff, and smaller than those of the other Species. This has not produced Fruit in *England*.

All these Sorts are preserved in the Gardens of the Curious, but are rather too tender to thrive in the open Air, near *London*, where they are sometimes planted against Walls, and with a little Protection in very severe Frost, they are maintained pretty well; but in *Devonshire* there are some of these Trees, which have grown in the open Air many Years, and are seldom injured by the Frost, but the Summers are not warm enough to bring the Fruit to Maturity. There were several of these Trees planted against a warm Wall at *Cambden-House* near *Kenington*, which succeeded very well, till their Tops were advanced above the Wall; after which they were generally killed in Winter, so far down as the Top of the Wall. These in 1719 produced a good Number of Fruit, which grew so large as to be fit for Pickling; but since that Time, their Fruit has seldom grown to any Size.

The Olive was, by the Ancients, considered as a maritime Tree, and they supposed it would not thrive at any Distance from the Sea; but, by Experience, we find they will succeed very well in any Country, where the Air is of a proper Temperature of Heat, though the

Trees are found to bear the Spray of the Sea better than most other Sorts.

In *Languedoc* and *Provence*, where the Olive Tree is greatly cultivated, they propagate it by Truncheons split from the Roots of the Trees; for as these Trees are frequently hurt by hard Frosts in Winter, so when their Tops are killed, they send up several Stalks from the Root; and when these are grown pretty strong, they separate them with an Ax from the Root, in doing which they are careful to preserve a few Roots to the Truncheons; these are cut off in Spring, after the Danger of Frost is over, and planted about 2 Feet deep in the Ground, covering the Surface with Litter or Mulch, to prevent the Sun and Wind from penetrating and drying the Ground; when the Plants have taken new Root, they are careful to stir the Ground and destroy the Weeds.

This Tree will grow in almost any Soil; when it is planted in rich moist Ground, they grow larger and make a finer Appearance, than in poor Land; but the Fruit is of less Esteem, because the Oil made from it, is not so good as that produced in leaner Soil. Chalky Ground is esteemed the best for these Trees, and the Oil made from the Trees growing in that Sort of Land is much finer, and will keep longer.

In the Countries where the Inhabitants are curious in making their Oil, they are frequently obliged to get Truncheons of the ordinary Sorts of Olives to plant; but after they have taken good Root, they graft them with the Sort which they prefer. In *Languedoc* they chiefly propagate the *Cormeau*, the *Ampoulan*, and *Mourreau*, which are 3 Varieties of the 1st Species: But in *Spain* the 2d Sort is generally cultivated, where they have more Regard to the Size of the Fruit, and the Quantity of Oil they will produce, than to their Quality.

If the Culture of these Trees was well understood by the Inhabitants of *Carolina*, and properly pursued, it might become a valuable Branch of Trade to them; for there is no Reason to doubt of their succeeding, the Summers there being hot enough to ripen the Fruit to its utmost Perfection.

In this Country the Plants are only preserved by Way of Curiosity, and placed in Winter in the Green-house for Variety, so I shall next give an Account of the Method by which they are here propagated, with their Manner of Treatment.

These Plants may be propagated by laying down their tender Branches (as practised for other Trees,) which should remain undisturbed two Years; in which Time they will have taken Root, and may then be taken off the old Plants, and transplanted either in Pots filled with fresh light Earth, or into the open Ground in a warm Situation. The best Season for transplanting them is the Beginning of *April*, when, if possible, take the Opportunity of a moist Season; and those which are planted in Pots, should be placed in a shady Part of the Green-house until they have taken Root; but those planted in the Ground should have Mulch laid about their Roots, to prevent the Earth from drying too fast, and now and then refreshed with Water; but by no Means let them have too much Moisture, which will rot the tender Fibres of their Roots, and destroy the Trees. When the Plants have taken fresh Root, those

in the Pots may be exposed to the open Air, with other hardy Exoticks, with which they should be housed in Winter, and treated as Myrtles, and other less tender Trees and Shrubs; but those in the open Air will require no farther Care until the Winter following, when you should mulch the Ground about their Roots, to prevent the Frost from penetrating deep; and if it should prove very severe, cover them with Matts, which will defend them from being injured thereby; but you must be cautious not to let the Matts continue over them after the Frost is past, lest by keeping them too close, their Leaves and tender Branches should turn mouldy for Want of free Air, which will be of as bad Consequence to the Trees, as if they had been exposed to the Frost, and many Times worse; for it seldom happens, if they have taken much of this Mold, or have been long covered, so that it has entered the Bark, that they ever recover again; whereas it often happens, that the Frost only destroys the tender Shoots; but the Body and larger Branches remaining unhurt, put out again the succeeding Spring.

These Trees are generally brought over from Italy every Spring, by the Persons who bring over the Oranges, Jasmynes, &c. from whom they may be procured reasonable; which is a better Method than to raise them from Layers in this Country, that being too tedious; and those which are thus brought over, have many Times very large Stems, to which Size young Plants in this Country would not arrive in 10 or 12 Years Growth. When you first procure these Trees, you should (after having soaked their Roots 24 Hours in Water, and cleaned them from the Filth they have contracted in their Passage) plant them in Pots filled with fresh light sandy Earth and plunge them into a moderate hot Bed, observing to screen them from the Violence of the Sun in the Heat of the Day, and refresh them with Water, as you find the Earth in the Pots dry. In this Situation they will begin to shoot in a Month or six Weeks after, when you should let them have Air in Proportion to the Warmth of the Season; after they have made pretty good Shoots, inure them to the open Air by Degrees, into which they should be removed, placing them in a Situation where they may be defended from strong Winds; in this Place they should remain till October following, when they must be removed into the Greenhouse, as was before directed. Having thus managed these Plants until they have acquired strong Roots, and made tolerable good Heads, you may draw them out of the Pots, preserving the Earth to their Roots, and plant them in the open Air in a warm Situation where you must manage them as was before directed for the young ones, and these will in two or three Years produce Flowers, and in very warm Seasons some Fruit, provided they do well. The *Lucca* and Box-leaved Olives are the hardiest, for which Reason they should be preferred to plant in the open Air, but the 1st Sort will grow to be the largest Trees.

OMPHALODES. See *Cynoglossum*.

ONAGRA. See *Oenothera*.

ONIONS. See *Cepa*.

ONOBRYCHIS. *Tourn. Inst. Hedyfarum. Lin. Gen. Pl. 793.* [*Ono*, an Ass, and *bray*, to make a Noise, or Bray, because the Scent of this Plant makes Asses bray;

or because when Asses eat these Husks, they are said always to bray.] Cock's Head, or Saintfoin.

The Characters are,

The Empalement of the Flower is permanent, of one Leaf cut into 5 Parts at Top. The Flower is of the Butterfly Kind. The Standard is oblong and reflexed, indented at Top. The Wings are oblong and erect. The Keel is compressed, broad at the End, and bifid at the Base. It has 10 angular Stamina, 9 joined, and one separate, terminated by roundish compressed Summits, and a narrow compressed Germen, supporting an Awl-shaped Style, crowned by a single Stigma. The Germen becomes a compressed roundish Pod, which opens with 2 Valves, inclosing one Kidney-shaped Seed.

The Species are,

1. *ONOBRYCHIS foliis pinnatis, leguminibus aculeatis, corollarum alis calyce brevioribus.* Cocks Head with winged Leaves, prickly Pods, and the Wings of the Flowers shorter than the Empalement. This is the *Onobrychis foliis viciae, fructu echinato major.* C. B. P. 350. Cocks Head with Vetch Leaves, and a larger prickly Fruit, or common Saintfoin.

2. *ONOBRYCHIS foliis pinnatis, leguminibus aculeatis, petalis aequalibus* Cocks Head, or Saintfoin with winged Leaves, prickly Pods, and equal Petals to the Flowers. This is the *Onobrychis fructu echinato, minor.* C. B. P. 350. Smaller Saintfoin with a prickly Fruit.

3. *ONOBRYCHIS foliis pinnatis, leguminibus rugosis, petalis aequalibus, calycibus brevissimis.* Cocks Head with winged Leaves, rough Pods, equal Petals to the Flowers, and very short Empalements. This is the *Onobrychis Italica perennis, erecta, foliis viciae, floribus dilute viridibus fructu exiguu non echinato sed rugoso & cristato.* Hort. Pis. Perennial erect Italian Saintfoin with Vetch Leaves, pale red Flowers, and a small rough Fruit, which is not prickly but crested.

ONOBRYCHIS foliis pinnatis, foliosis obtusis, leguminibus aculeatis, petalis subaequalibus. Cocks Head with winged Leaves, having obtuse Lobes, prickly Pods, and the Petals of the Flowers almost equal. This is the *Onobrychis Cretica, foliis viciae, fructu magno, cristato & aculeato.* Tourn. Cor. 26. Cretan Saintfoin with a Vetch Leaf, and a large, crested, prickly Fruit.

The 1st Sort is commonly cultivated in the Fields for Fodder for Cattle, and is a great Improvement to chalky Lands, where very little natural Grass would be produced, if it was encouraged; so that many Estates have been improved since this, and other Grasses have been introduced, to double their Rent.

The Roots of this Plant are large, stringy, and run deep in the Ground, from which come out several winged Leaves, composed of 8 or 10 Pair of oval Lobes, placed opposite along the Mid-rib, terminated by an odd one. The Stalks rise near 2 Feet high; these are garnished toward the Bottom, with the like winged Leaves, but the upper Part of the Stalk is naked to about 6 Inches of the Top, where they are terminated by Spikes of soft red Flowers, shaped like those of the French Honeysuckle, but smaller; these are succeeded by roundish, compressed, prickly Pods, each having one Kidney-shaped Seed. It flowers in June, and the Seeds are ripe in September, but the Roots will continue many Years; there

there are 2 or 3 Varieties of this, which differ only in the Colour of their Flowers.

The 2d Sort grows naturally in *Sicily* and *Spain*; this is an annual Plant, which perishes soon after it has perfected Seeds. It has a jointed Stalk, a Foot and a Half high; from each Joint comes out one winged Leaf, composed of 6 or 8 small oval Lobes, terminated by an odd one, and close to the Base of the Leaf, arises a naked Foot Stalk, 4 or 5 Inches long, sustaining at the Top a few small purplish Flowers, shaped like the former, but the Petals are of equal Length; they are succeeded by larger Pods than the first, which are crested, and armed with stronger Prickles. It flowers the latter End of *June*, and the Seeds ripen in Autumn.

The 3d Sort grows naturally in *Italy*; this hath a perennial Root, which runs deep in the Ground; from which arise several slender branching Stalks, a Foot and a Half high, garnished with winged Leaves, composed of 9 or 10 Pair of narrow Lobes, and terminated by an odd one. The Stalks are terminated by long loose Spikes of pale red Flowers, much smaller than those of the first Sort, whose Petals are almost equal in Length; these are succeeded by small rough crested Pods which are not armed with Prickles. It flowers and ripens Seeds about the same Time as the first.

The 4th Sort grows naturally in the Island of *Crete*; this has a perennial Root like the first. The Stalks are stronger, and rise near 2 Feet high; they are garnished with winged Leaves composed of 9 or 10 Pair of Lobes, terminated by an odd one. The Lobes of this Sort are broader than the first Sort, and end in obtuse Points; they are of a deep green, and stand more erect. The Flowers are produced in pretty long Spikes; they are of a pale red Colour, and as large as those of the first, their Petals are almost of equal Length; these are succeeded by larger, compressed, crested Pods than those of the first, and strongly armed with Prickles. It flowers in *July*, and the Seeds ripen in Autumn.

The 1st is an abiding Plant, which, if sown upon a dry, gravelly, or chalky Soil, will continue 18 or 20 Years, without renewing; but if it be sown upon a deep, light, moist Soil, the Roots will run down into the Ground, and in Winter the Moisture will rot them, so that it seldom lasts above two Years in such Places.

This is esteemed one of the best Sorts of Fodder for most Cattle, and is a great Improvement to chalky Hills, upon which it succeeds better than in any other Soil, and will continue many Years, provided there is a Surface of six or eight Inches upon the Chalk.

The best Season for sowing this Seed is in the Beginning, or Middle of *April*, according as the Season is early or late, observing always to do it in dry Weather, otherwise the Seed will be apt to burst with Moisture, and never come up. These Seeds being large, there will require a greater Quantity in Measure to sow an Acre, than of many other Sorts, the common Allowance is four Bushels to an Acre, but I would not advise above three at most; and if this Seed were sown in Rows, in the Manner directed for the *Mediterranean*, it would be a great Improvement to the Plants, for when they have Room enough, they are very subject to branch out on every Side, and become very strong, so that when they are in Rows, that the Ground between them can be stirred with a

Hoe Plough, it will cause them to shoot much stronger than when they grow so close, that there can be Culture bestowed on them, and by hoeing between the Plants, the natural Grass will be kept down, which, if permitted to grow, will rob the Saintfoin of its Nourishment, and in Time destroy it.

I have taken up Roots of this Kind, where they have grown singly, and been kept clear from Weeds, whose Shoots have spread near two Feet wide, and were much stronger than those which grew nearer together upon the same Soil.

There are some who recommend sowing Oats or Barley with this Seed; but that is a very bad Method, for what is gained from the Crop of Corn, will be doubly lost in the Saintfoin; and this generally holds true in most Sorts of Grass Seeds, for the Corn growing over it doth so weaken the Crop beneath, that it scarcely recovers its Strength in a Year's Time after.

The Ground in which this Seed is sown, should be well ploughed, and made very fine; and if you sow it in Rows, the Drills should be made 18 Inches asunder, and about an Inch deep, in which the Seeds should be sown indifferently thick, for if the Plants come up too close, it will be very easy to hoe them out, so as to leave the remaining ones 6 or 8 Inches asunder, for the Ground should be hoed after the Plants are come up, to destroy the Weeds, which, if suffered to grow, would soon over-bear the young Plants, and destroy them, but when the Plants have obtained Strength, they will prevent the Weeds from growing up among them.

The first Year after Sowing, by no Means feed it down, for the Crown of the Roots being then young and tender, the Cattle would eat it so low, as entirely to destroy the Roots, and if large Cattle were let in upon it, they would trample it down so much as to prevent its shooting again; therefore the first Year it should be mowed, which should be done when it is in flower.

The sooner this is carried off the Ground, when cut, it will be the better for the Plants, so that if it were carried on a neighbouring Ground to be made, the second Crop will come up sooner and stronger; this doth not require to be so often turned as other Hay, for as the Stalks are large, they will not lie so close in the Cocks as to ferment; therefore in catching Weather, the Cocks may be made large, and if they are turned and spread every other Day, or once in three Days, there will be little Danger of its heating, so as to receive Damage; but if it is spread, and much exposed to Rain and Dews, the Goodness of the Hay will be exhausted.

The Time when this Crop will be fit to cut the first Year, is toward the End of *July*, or Beginning of *August*. After this is cleared off, the Roots will soon shoot again, and by the End of *September*, if the Season is favourable, there will be a fine Crop fit for feeding; at which Time, or soon after, you may turn in Sheep, which will, in eating down the Grass, enrich the Ground with their Dung, whereby the Roots will be greatly strengthened, but do not suffer them to remain too long upon it, as I before observed, lest they should eat it down too low, which would destroy the Roots, nor should they ever be suffered to remain upon it longer than the Middle of *November* the first Year, and the succeeding Years

Years when the Crop is early cut, it should not be fed longer than the Middle of September.

There are some who cut two Crops of this Hay in a Year, but the latter Crop is seldom of much Value, and this weakens the Roots, for which Reason it should not be practised; when the Seeds of Saintfoin are to be sowed, the Crop should not be fed too low the foregoing Autumn, for that will occasion the Stalks to be weak, therefore the best Husbandry is not to feed it the Season before, for I have made Trial of two Rows of Plants standing by each other, one of which I cut down in September, with Care, so as not to cut any Buds for the future Shoots; the other Row I left untouched, and the following Spring I found those Plants which were not cut, put out earlier and stronger, and the Stalks grew taller than those which were cut, the Plants produced a greater Quantity of Seeds, and they were ripe a Fortnight sooner.

The Hay which is made from the Plants, saved for Seed, is of but little Value, being no better Fodder than chopped Straw, or Chaff, so that those who are desirous to have the Hay in Perfection, should cut it before it begins to flower, when it abounds more with Juice, and will nourish Cattle much more than that which stands to be in full flower.

This Sort of Hay is exceeding good for Horses, and is esteemed one of the best Sorts of Food for most Cattle, especially in the Spring, there being no Danger attending it, as there is in Clover, and some other Sorts of Fodder; it breeds abundance of Milk, and the Butter made of it is very good.

Since this Grass has been introduced into England, there have been many Dairy Farms set up, in such Places where it was formerly thought impracticable, and if this Plant, and the Lucern, were properly cultivated, there might be yet much greater Improvements made; for hereby not only a much greater Quantity of Milch Cows might be maintained, but also a greater Number of Black Cattle might be fattened, and more Sheep and Hogs, which would be a great Improvement to many Estates in the hilly Countries, for by increasing the live Stock, there will be an Addition of Manure for dressing the Land in Proportion.

The other Sorts of this Plant are preserved in Botanic Gardens for Variety, but as they have little Beauty, or Use, they are rarely admitted into other Gardens. The 2d Sort being an annual Plant, the Seeds must be sown on an open Border every Spring, where the Plants are to remain, and require no other Care, but to thin and keep them clean from Weeds; the other Sorts require the same Culture as the first.

ONONIS. Lin. Gen. Plant. 772. *Anonis*. Tourn. Inst. R. H. 408. Tab. 229. Rest-harrow, Cammock, Petty-whin; in French, *Arête beuf*.

The Characters are,

The Empalement of the Flower is cut into five narrow Segments, which end in acute Points, the upper being a little raised and arched, the lower bending under the Keel. The Flower is of the Butterfly Kind. The Standard is Heart-shaped, depressed on the Sides, and larger than the Wings. The Wings are oval and short; the Keel is pointed, and longer than the Wings. It hath ten Stamina joined together, terminated by single Summits, and an oblong hairy

Germen, supporting a single Style, crowned by an obtuse Stigma. The Germen afterward becomes a turgid Pod with one Cell, inclosing Kidney-shaped Seeds.

The Species are,

1. ONONIS floribus subsessilibus solitariis lateralibus, caule spinoso. Hort. Cliff. 359. Rest-harrow with single Flowers sitting close to the Sides of the Branches, and a prickly Stalk. This is the *Anonis spinosa flore purpureo*. C. B. P. 389. Prickly Rest-harrow with a purple Flower, sometimes called Cammock, or Petty-whin, and in some Countries, French Furze.

2. ONONIS floribus subsessilibus solitariis lateralibus, ramis inermibus. H. C. 359. Rest-harrow with single Flowers sitting close to the Stalks, and Branches without Spines. This is the *Anonis spinis carens purpurea*. C. B. P. Purple Rest-harrow having no Spines.

3. ONONIS caulibus procumbentibus, floribus subsessilibus solitariis, foliis birsutis. Rest-harrow with trailing Stalks, single Flowers sitting close to the Branches, and hairy Leaves. This is the *Anonis maritima procumbens, foliis birsutis pubescentibus*. Pluk. Alm. 33. Trailing maritime Rest-harrow with hairy Leaves.

4. ONONIS foliis ternatis carnosiss sublinearibus tridentatis, Lin. Sp. Plant. 718. Rest-harrow with trifoliate fleshy Leaves, narrow, and have three indentures. This is the *Anonis Hispanica, frutescens, folio tridentato carnosio*. Tourn. Inst. 408. Shrubby Spanish Rest-harrow with a fleshy Leaf, having three indentures.

5. ONONIS floribus paniculatis, pedunculis subtrifloris, stipulis vaginalibus, foliis ternatis. Hort. Cliff. 358. Rest-harrow with paniculated Flowers, generally growing three upon a Foot Stalk, sheath-like Stipulae, and trifoliate Leaves. This is the *Anonis purpurea verna precax frutescens, flore rubro amplo*. Mor. H. Early Spring purple shrubby Rest-harrow, with a large red Flower.

6. ONONIS pedunculis unifloris filo terminatis foliis ternatis. Hort. Cliff. 358. Rest-harrow with one Flower on a Foot Stalk, which is terminated by a Thread, and trifoliate Leaves. This is the *Anonis viscosa spinis carens lutea major*. C. B. P. 389. Glutinous Rest-harrow without Spines, and having a large yellow Flower.

7. ONONIS pedunculis unifloris, filo terminatis, caule ramoso villosa, foliis ternatis serratis. Rest-harrow with one Flower on each Foot Stalk, which are terminated by a Thread, a branching hairy Stalk, and trifoliate sawed Leaves. This is the *Anonis annua erectior, latifolia glutinosa Lusitanica*. Tourn. Inst. 409. Annual broad-leaved, glutinous, erect Rest-harrow of Portugal.

8. ONONIS floribus sessilibus lateralibus, foliis omnibus ternatis petiolatisque, stipulis setaceis. Lin. Sp. Plant. 717. Rest-harrow with Flowers sitting close to the Sides of the Stalks, all the Leaves trifoliate, growing upon Foot Stalks, and bristly Stipulae. *Anonis flore luteo parvo*. H. R. Par. Rest-harrow with a small yellow Flower.

9. ONONIS pedunculis unifloris praelongis, ramis inermibus, foliis ternatis glabris, vaginis acute dentatis. Rest-harrow with one Flower growing on a long Foot Stalk, Branches without Spines, smooth trifoliate Leaves, and Sheaths sharply indented. This is the *Anonis glabra inermis, pedunculis unifloris praelongis vaginis cristatis*. Allion. Smooth Rest-harrow without Spines, and having one Flower on a long Foot Stalk, with a crested Sheath.

10. ONONIS pedunculis unifloris lateralibus, caule ramoso

maso hirsuto, foliis ternatis sublinearibus petiolatisque. Rest-harrow with one Flower on a Foot Stalk, proceeding from the Sides of the Stalks, a hairy branching Stalk, and narrow trifoliate Leaves growing on Foot Stalks. This is the *Anonis non spinosa, hirsuta, viscosa, odore theriacæ.* Hort. Catb. Supp. Hairy glutinous Rest-harrow without Thorns, and smelling like Venus Treacle.

11. *ONONIS pedunculis bifloris, filo terminatis.* Prod. Leyd. 376. Rest-harrow with two Flowers on a Foot Stalk, which are terminated by a Thread. This is the *Anonis siliquis ornithopodii.* Boerh. Ind. alt. 2. 34. Rest-harrow with Pods like those of the Bird's-foot.

12. *ONONIS pedunculis axillaribus trifloris nudis, foliis ternatis.* Hort. Cliff. 358. Rest-harrow with naked Foot Stalks proceeding from the Sides of the Branches, and sustaining three Flowers, and trifoliate Leaves. This is the *Cicer sylvestre latifolium triphyllum.* C. B. P. 347. Broad three-leaved wild Chick.

13. *ONONIS pedunculis quinquefloris axillaribus, caulibus diffusis procumbentibus, foliis ternatis, leguminibus lunulatis.* Rest-harrow with five Flowers on a Foot Stalk, proceeding from the Sides of the Branches, diffused trailing Stalks, trifoliate Leaves, and Moon-shaped Pods. *Anonis procumbens, medicæ facie.* Hort. Cbelf. Trailing Rest-harrow with the Appearance of Medick.

14. *ONONIS stipulis floralibus ovatis membranaceis integerrimis.* Prod. Leyd. 376. Rest-harrow with oval, entire, membranaceous Stipulæ to the Flowers. *Anonis alopecuroides, mitis annua purpurascens.* Hort. Eltb. 28. Smooth annual purplish Fox-tail Rest-harrow.

15. *ONONIS foliis ternatis lanceolato-ovatis integerrimis, caule erecto herbaceo, racemo terminali.* Rest-harrow with trifoliate, Spear-shaped, oval, entire Leaves, and an erect herbaceous Stalk, terminated by a loose Spike of Flowers. This is the *Anonis Caroliniana perennis, non spinosa, foliorum marginibus integris, floribus in thyrsis candidis.* Martyn. Cent. 44. Tab. 44. Perennial Carolina Rest-harrow without Spines, the Borders of the Leaves entire, and white Flowers growing in loose Spikes.

16. *ONONIS spicis foliosis simplicibus obtusis.* Lin. Sp. Plant. 717. Rest-harrow with leafy Spikes, and single obtuse Leaves. This is the *Anonis ficula alopecuroides.* Tourn. Inst. 408. Foxtail Rest-harrow of Sicily.

17. *ONONIS foliis ternatis ovatis, petiolis longissimis, leguminibus hirsutis.* Rest-harrow with oval trifoliate Leaves growing on very long Foot Stalks, and hairy Pods. This is the *Anonis Americana, folio latiori subtundo.* Tourn. Inst. R. H. 409. American Rest-harrow with a broader roundish Leaf.

18. *ONONIS foliis ternatis lineari-lanceolatis, caule decumbente, floribus spicatis alaribus, leguminibus glabris.* Rest-harrow with trifoliate, narrow, Spear-shaped Leaves, a trailing Stalk, Flowers growing in Spikes from the Wings of the Stalk, and smooth Pods. This is the *Anonis Americana, angustifolia, humilior & minus hirsuta.* Honst. Mss. Lower narrow-leaved American Rest-harrow, which is less hairy.

19. *ONONIS foliis ternatis lanceolatis, caule diffusis procumbente, stipulis floralibus lanceolatis.* Rest-harrow with trifoliate Spear-shaped Leaves, a diffused trailing Stalk, and Spear-shaped Stipulæ to the Flowers. This is the *Anonis non spinosa glabra minor, procumbens, flore*

luteo. Sloan. Cat. 75. Lesser trailing smooth *Anonis*, having no Spines, and with a yellow Flower.

The 1st Sort is a common Weed in most Parts of England, so is rarely admitted into Gardens. It has a strong creeping Root, which spreads far in the Ground, and is with great Difficulty eradicated; the Stalks rise a Foot and a Half high, they are slender, reddish, and hairy, sending out small Branches on their Side, which are armed with sharp Prickles. The Flowers come out singly from the Side of the Branches, they are of the Butterfly Kind, and of a purple Colour, which are succeeded by small Pods, containing one or two Kidney-shaped Seeds. It flowers great Part of Summer, and the Seeds ripen in the Autumn. The Root of this is one of the five opening Roots; the cortical Part of it is esteemed a good Medicine for Stoppage of Urine, and to open the Obstructions of the Liver and Spleen; there is a Variety of this with white Flowers.

The 2d Sort grows naturally in many Parts of England, and has been by some supposed to be a Variety of the first; but I have cultivated both by Seeds, and have always found the Plants retain their Difference; the Stalks of this are hairy, and more diffused than those of the first; the Leaves broader, and sit closer on the Branches; the Stalks do not grow so upright, and have no Spines; the Flowers and Pods are like the first. There is a Variety of this with white Flowers.

The 3d Sort grows naturally on the Borders of the Sea in several Parts of England; this hath a creeping Root, from which arise many hairy Stalks, near two Feet long, spreading on every Side upon the Ground, garnished with trifoliate hairy Leaves, those on the lower Part of the Stalks being large and oval, but the upper are smaller and narrower. The Flowers are like those of the first in Shape, coming out singly from the Side of the Stalks, but are of a brighter purple Colour; the Pods are short, containing 2 or 3 Seeds in each. It flowers in July, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in Spain and Portugal; this rises with shrubby Stalks a Foot and a Half high, dividing into slender Branches, very full of Joints, garnished with narrow, trifoliate, thick, fleshy Leaves, standing on short Foot Stalks. The Flowers are produced at the End of the Branches in loose Panicles, some of the Foot Stalks sustaining two, and others but one Flower; they are a fine purple, and appear in June; the Seeds ripen in September.

The 5th Sort grows naturally on the Alps, this is a very beautiful low Shrub; it rises with slender shrubby Stalks about 2 Feet high, dividing into many Branches, garnished with narrow trifoliate Leaves sawed on their Edges, sitting close to the Branches. The Flowers come out in Panicles at the End of the Branches on long Foot Stalks, which for the most Part sustain 3 large purple Flowers; the Stipula is a Kind of Sheath, embracing the Foot Stalk of the Flower. It flowers in May, and the Flowers are succeeded by turgid Pods an Inch long, which are hairy, inclosing 3 or 4 Kidney-shaped Seeds, which ripen in August.

The 6th Sort grows naturally in the South of France and in Spain; this hath a perennial Root and an annual Stalk, which rises near 2 Feet high, sending out short Branches from the Side on the lower Part; these are gar-

nished with trifoliate oblong Leaves, which are hairy and clammy. The Flowers grow in loose Spikes at the End of the Stalks, they are large, and of a bright yellow, standing on pretty long Foot Stalks, which are extended beyond the Flowers, the Flowers hanging downward from the middle of the Foot Stalk. The Flowers appear the latter End of *June*, which are succeeded by turgid Pods an Inch long, containing 3 or 4 brown Kidney-shaped Seeds, which ripen in *September*.

The 7th Sort grows naturally in *Portugal*. This is an annual Plant, with a strong, herbaceous, hairy Stalk, rising a Foot and a Half high sending out Branches the whole Length, closely garnished with trifoliate Leaves; the middle Lobe being large and oval, the two Side Lobes long and narrow, rounded at their Points and indented on their Edges; they are very clammy. The Foot Stalks of the Flowers come out from the Wings of the Stalks singly, each sustaining one pale yellow Flower, standing erect in the Middle of the Foot Stalk, which is extended beyond the Flower. This Plant flowers in *July*, and the Seeds ripen in Autumn.

The 8th Sort grows naturally in the South of *France* and *Italy*; this is an annual Plant, the Stalks rise about 9 Inches high, sending out one or two Side Branches toward the Bottom; the Leaves are small, trifoliate, and oval, standing on pretty long Foot Stalks, and are indented on their Edges. The Flowers come out singly at the Wings of the Stalk, they are small, yellow, and sit very close to it, having a sharp bristly Stipula under the Empalement; the Pods are very short and turgid, containing 2 or 3 Kidney-shaped Seeds. It flowers in *July*, and the Seeds ripen in Autumn.

The 9th Sort grows naturally on the *Alps*; this hath a perennial Root, from which come out several slender, trailing Stalks about 6 Inches long, garnished with small, trifoliate, oval Leaves, indented on their Edges, standing on very short Foot Stalks. The Flowers come out singly toward the Top of the Stalk, on slender Foot Stalks, arising from the Wings of the Leaves, each sustaining one yellow Flower; the Sheath embracing the Base of the Foot Stalk, is sharply indented. This flowers in *June*, and the Seeds ripen in Autumn.

The 10th Sort grows naturally in *Sicily*; this is an annual Plant, the Stalk is round, smooth, and clammy, sending out many Branches their whole Length, garnished with narrow trifoliate Leaves, which are very clammy and hairy. The Flowers come out from the Wings of the Leaves singly, standing on pretty long Foot Stalks; they are of a pale yellow Colour, and are large; these are succeeded by Pods an Inch long, containing 3 or 4 Kidney-shaped Seeds. It flowers in *July*, and the Seeds ripen in Autumn.

The 11th Sort grows naturally in *Sicily*, and is an annual Plant; the Stalks rise about 9 Inches, sending out one or two Branches toward the Bottom; these are garnished with small trifoliate Leaves, which stand on short Foot Stalks. The Flowers come out from the Side of the Branches upon short Foot Stalks, each sustaining two small yellow Flowers, which are succeeded by jointed, compressed Pods, like those of Bird's-foot, having 4 or five Kidney-shaped Seeds in each. This Sort flowers in *July*, and the Seeds ripen in Autumn.

The 12th Sort grows naturally on the *Alpi* and *Hel-*

vetian Mountains; this rises with a single jointed Stalk a Foot and a Half high, garnished with oval, indented, trifoliate Leaves, standing on pretty long Foot Stalks. The Foot Stalks of the Flowers come out from the Wings of the Leaves they are long, slender and each sustains 3 pale yellow Flowers, succeeded by short turgid Pods, containing 2 or 3 turgid Pods in each. It flowers in *June*; the Seeds ripen in *September*.

The 13th Sort grows naturally in *Virginia*, from whence I received the Seeds. This is a biennial Plant, from the Root come out many diffused Stalks which trail on the Ground, garnished with roundish trifoliate Leaves indented on their Edges, having short Foot Stalks, they are of a light green and smooth. The Flowers come out toward the End of the Branches, on very slender Foot Stalks, which arise from the Wings of the Leaves, each sustaining 5 small yellow Flowers; these are succeeded by compressed Pods shaped like a Half-moon, or Medick Trefoil. It flowers in *July*; the Seeds ripen in Autumn.

The 14th Sort came up in Earth which was brought from *Barbadoes*, but it does not seem to be a Native of that Country, for it rises easily from Seeds in the open Air here, and perfects its Seeds in Autumn, nor will it thrive in greater Warmth. This hath an upright Stalk a Foot and a Half high, sending out small Side Branches, which are garnished with roundish trifoliate Leaves, sawed on their Edges, standing on short Foot Stalks. The Flowers grow in short leafy Spikes at the End of the Branches, they are small, and of a pale purple Colour, appearing in *July*, and are succeeded by short turgid Pods, containing 2 or 3 Kidney-shaped Seeds, which ripen in Autumn.

The 15th Sort grows naturally in *Carolina*, from whence Mr. *Catesby* sent the Seeds to *England*. This hath a perennial Root and annual Stalk; from the Root arises 3, 4 or 5 Stalks, in Proportion to the Size of the Root, which grow from 2 to 3 Feet high; they are smooth, herbaceous, and divide toward the Top into 2 or 3 Branches, garnished with trifoliate Leaves, whose Lobes are oval, Spear-shaped, and entire. The Stalks are terminated by loose Spikes of white Flowers near a Foot long, which are ranged alternately, and stand upon short Foot Stalks; these are succeeded by smooth turgid Pods an Inch and a Half long, inclosing 4 or 5 large Kidney-shaped Seeds. This flowers in *June*, and the Seeds ripen in *September*.

The 16th Sort grows naturally in *Portugal*, *Spain*, and *Italy*. This is an annual Plant, rising with upright branching Stalks a Foot high, garnished with single Leaves sitting close to the Stalks; the larger Leaves are oval, about one Inch long and three Quarters of an Inch broad; the upper Leaves are narrow, ending in obtuse Points, and are slightly indented at their Ends. The Flowers grow in leafy Spikes at the End of the Stalks set close together, having hairy Empalements; they are pretty large, of a purple Colour, and appear in *July*; these are succeeded by taper Pods an Inch long, inclosing 4 or 5 Kidney-shaped Seeds. This Plant has several Titles, in the different Books of Botany.

The 17th Sort grows naturally in the *American* Islands; this is also annual, rising with a branching Stalk 2 Feet high, garnished with trifoliate Leaves, whose Lobes

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Lobes are oval, standing on very long hairy Foot Stalks, The Flowers grow in loose Spikes at the End of the Branches, they are large, of a purplish yellow Colour, and are succeeded by very turgid hairy Pods, each containing 5 or 6 large Kidney-shaped Seeds. This Sort flowers in *July* and *August*, and the Seeds ripen in Autumn. From this Plant Indigo was formerly made, which, I suppose, was of less Value than that which is made of *Azil*, so has not been for many Years past cultivated in any of the Islands.

The 18th Sort was discovered by Dr. *Houftoun*, growing naturally at *La Vera Cruz* from whence he sent the Seeds to *England*. This is a perennial Plant, from the Root come out several pretty strong Branches, which spread and incline toward the Ground; these are garnished with narrow trifoliate Leaves, very little hairy. The Flowers come out in loose Panicles at the End of the Branches; they are yellow, and are succeeded by smooth turgid Pods about half an Inch long, each containing 2 or 3 Kidney-shaped Seeds. This flowers in *July*, and the Seeds sometimes ripen here in Autumn.

The 19th Sort grows naturally in *Jamaica*, from whence Dr. *Houftoun* sent the Seeds in 1730. This hath a perennial Root, from which are sent out many trailing diffused Stalks near 2 Feet long, which spread on every Side; these are garnished with small Spear-shaped, trifoliate Leaves, which are smooth. The Flowers are produced in short Spikes from the Side and at the Extremity of the Branches; they are small, and of a deep yellow Colour, having Spear-shaped Stipulæ. It flowers in *August*, but has not perfected Seeds in *England*.

The three first Sorts are never cultivated in Gardens; they are very troublesome Weeds when they get into Fields, for the Roots spread and multiply greatly in the Ground; and are so tough and strong, that the Plough will scarcely cut through them, so are with Difficulty eradicated when they have once got Possession.

The 4th and 5th Sorts are low shrubby Plants, which are propagated by Seeds. The 4th is too tender to thrive in the open Air in *England*, unless it is planted in a warm Situation, and covered in very severe Frost. If the Seeds of both Sorts are sown upon a Bed of light Earth in *April*, the Plants will come up in *May*, when they must be kept clean from Weeds; and if they are too close, some of them should be carefully drawn up in moist Weather, and transplanted at 4 or 5 Inches Distance; those of the 4th Sort upon a warm sheltered Border, but the 5th may be planted in a shady Border, where they will thrive very well; after these have taken Root, they will require no Care but to keep them clean from Weeds till the following Autumn, when they may be transplanted to the Places where they are to remain; those Plants which were left growing in the Bed where they were sown, must also be treated in the same Way. These Plants will not thrive in Pots, therefore should always be planted in the full Ground, where the 5th Sort will flourish greatly, and frequently send up many Plants from their Roots, but the other is more impatient of Cold. These Plants will flower the 2d Year, and make a fine Appearance during the Continuance of their Flowers; the 5th Sort will produce Seeds in Plenty.

The 6th Sort is propagated by Seeds, which should

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be sown thin in Drills, on a Bed of light Earth; and when the Plants come up, they must be kept clean from Weeds till the Autumn, when they should be carefully taken up, and transplanted into the Borders of the Pleasure Garden, where they are to remain; the second Year they will flower and produce ripe Seeds, but the Roots will continue several Years, and are very hardy.

The 7th, 8th, 10th, 11th, 14th, and 16th Sorts, are annual hardy Plants; these are propagated by Seeds, which should be sown where the Plants are to remain, and require no other Care but to thin them where they are too close, and keep them clean from Weeds.

The 9th Sort is a hardy perennial Plant, but as it makes but little Appearance, it is rarely preserved, unless in Botanick Gardens for Variety; it rises easily from Seed, and will thrive in any Soil or Situation.

The 13th Sort is a biennial Plant. The Seeds of this should be sown on a Bed of fresh Earth, where the Plants are to remain, and when they come up, if they are thinned where they grow too close, and kept clean from Weeds, they will require no other Culture.

The 15th Sort is propagated by Seeds, which should be sown on a moderate hot Bed in Spring; when the Plants are fit to remove, they should be each transplanted into a small Pot, plunging them into a gentle hot Bed, observing to shade them till they have taken new Root; then gradually inure them to the open Air, and the latter End of *May*, or Beginning of *June*, they may be fully exposed to the open Air, but in Autumn they should be placed under a common hot Bed Frame, to screen them from Frost in Winter. The Spring following they may be shaken out of the Pots, and planted in the full Ground, where they are to remain. As these have long Tap Roots, they will not thrive long in Pots, and if planted in wet Ground, their Roots will rot in Winter, but in a dry Soil they are never hurt by Cold, and their Roots will abide many Years.

The 17th Sort is an annual Plant; the Seeds of this Sort must be sown upon a moderate hot Bed in Spring, and, when the Plants are fit to remove, they should be transplanted on another hot Bed, to bring them forward, treating them as the *African* and *French* Marygold. In *June* they should be taken up with Balls of Earth to their Roots, and transplanted into the open Borders, where if they are shaded till they have taken Root, they will thrive and flower the following Month, and perfect their Seeds in Autumn.

The 18th and 19th Sorts are tender Plants. The Seeds of these should be sown on a good hot Bed in Spring, and when the Plants are fit to remove, they should be each planted in a small Pot filled with light loamy Earth, and plunged into a hot Bed of Tanners Bark, observing to shade them from the Sun till they have taken new Root, after which they must be treated as other tender Plants from the same Countries. In Autumn they should be removed into the Bark Stove; the Summer following they will produce Flowers, but they do not often perfect Seeds in *England*.

ONOPORDUM. *Lin. Gen. Plant.* 834. *Vaill. Act. Par.* 1718. *Carduus. Tourn. Inst. R. H.* 440. *Tab.* 253. Woolly Thistle; in *French*, *Cardon*.

The Characters are,

The common Empalement is roundish, bellied, and imbricated,

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cated, composed of numerous Scales terminated by Spines. The Flower is composed of many hermaphrodite Florets, which are equal and uniform; they are Funnel-shaped, having narrow Tubes swelling at the Brim, and cut into five Points; they have five short hairy Stamina terminated by cylindrical Summits, and an oval Germen crowned with Down, supporting a slender Style terminated by a crowned Stigma. The Germen becomes a single Seed crowned with Down, sitting in the Empalement.

The Species are,

1. *ONOPORDUM calycibus squarrosis, foliis ovato-oblongis sinuatis. Lin. Sp. Pl. 827.* Woolly Thistle with rough Empalements, and oblong, oval, sinuated Leaves. This is the *Carduus tomentosus, acanthi folio, vulgaris. Tourn.* Common Woolly Thistle with a Bearbreech Leaf.

2. *ONOPORDUM calycibus squarrosis, foliis linearibus pinnatifidis. Lin. Sp. Pl. 827.* Woolly Thistle with rough Empalements, and narrow Leaves ending in many Points. *Carduus tomentosus, acanthi folio angustiori. Tourn.* Woolly Thistle with a narrower Bearbreech Leaf.

3. *ONOPORDUM calycibus imbricatis. Hort. Upsal. 249.* Woolly Thistle with imbricated Empalements. This is the *Carduus tomentosus, acanthi folio altissimus, Lusitanicus. Tourn. Infr. 441.* Tallest Woolly Thistle of Portugal with a Bearbreech Leaf.

4. *ONOPORDUM calycibus squarrosis, foliis oblongis pinnato-sinuatis decurrentibus, capite magno. Woolly* Thistle with rough Empalements, oblong, sinuated, Wing-pointed Leaves running along the Stalk, and a large Head. This is the *Carduus tomentosus, acanthi folio, Aleppicus, magna flore. Tourn.* Woolly Thistle of Aleppo with a Bearbreech Leaf, and a large Flower.

5. *ONOPORDUM calycibus squarrosis, foliis linearibus pinnatifidis decurrentibus, capite magno. Woolly* Thistle with rough Empalements, narrow, oblong, Wing-pointed Leaves running along the Stalk, and a large Head. This is the *Carduus Creticus, acanthi folio viridi, & glutinoso, flore purpurascens. Tourn. Cor. 31.* Woolly Thistle of Crete with a green, glutinous, Bearbreech Leaf, and a purplish Flower.

6. *ONOPORDUM foliis oblongo ovatis dentato aculeatis capite sessili. Woolly* Thistle with oblong, oval Leaves, having prickly Indentures, and a Head sitting close to the Ground. This is the *Onopordon acaulon serme flore albicante. D. Jussieu. Vail. Mem. 1718.* Woolly Thistle without Stalk, and having a whitish Flower.

There are some other Species of this Genus in Botanical Gardens, and several Varieties differing in the Colours; but as these Plants are rarely admitted into other Gardens, I shall not enumerate them here.

The 1st Sort grows naturally on uncultivated Places in England. It is a biennial Plant; the first Year it puts out many large, downy Leaves, which are sinuated on their Edges, and are prickly; these spread on the Ground, and continue the following Winter, and in the Spring arises the Stalk in the Middle of the Leaves, which, upon Dung-hills, or good Ground, grows 5 or 6 Feet high, dividing upward into many Branches, which have leafy Borders running along them; these are indented, and each Indenture is terminated by a Spine. The Stalks are terminated by scaly Heads of purple Flowers, which appear in June, and to these succeed oblong, angular Seeds crowned with a hairy Down, which assist their

Spreading about to a great Distance by the Wind, so that where the Plants are permitted to ripen their Seeds, they often become troublesome Weeds.

The 2d Sort grows naturally in Spain, Portugal, and the Levant; this rises with a taller Stalk than the first, the Leaves are much longer and narrower, and the Indentures on their Sides regular, ending in sharp Spines. The Heads of Flowers are larger, and the Spines of the Empalement longer than those of the first Sort.

The 3d Sort grows 9 or 10 Feet high, the Stalks divide into many Branches, the Leaves are longer than of any other Species, the Heads of Flowers are large and of a purple Colour, the Empalement hath the Scales lying over each other like the Scales of Fish. This grows naturally in Spain and Portugal.

The 4th Sort grows naturally at Aleppo; this rises with an upright branching Stalk, 7 or 8 Feet, the Leaves are long and regularly sinuated on their Borders, like Wing-pointed Leaves. The Heads of Flowers are very large, and the Empalement is very rough and prickly.

The 5th Sort grows naturally in Crete; the Stalks of this rise about 6 Feet high, the Leaves are greener than those of any other Species, and but slightly indented on their Borders, they are very clammy, and their Spines but short; the Heads of Flowers are large, and the Flowers purple.

The 6th Sort hath several oblong, oval, woolly Leaves, which spread on the Ground, between these comes out the Head of Flowers sitting close to the Ground, these Heads are smaller than any of the other, and the Flowers are white. Some of these Plants have been formerly cultivated for the Table, but it was before the English Gardens were well supplied with other esculent Plants, for at present they are rarely eaten here. They require no Culture, for if the Seeds are permitted to fall, the Plants will come up fast enough.

OPHIOGLOSSUM, Adders-Tongue.

This Plant grows naturally in moist Meadows, and is not easily made to thrive in Gardens.

OPHRYS. Tourn. Infr. R. H. 437. Tab. 250. Lin. Gen. Plant. 902. Twyblade.

The Characters are,

It has a single Stalk with a vague Spatha (or Sheath.) The Flower hath no Empalement, it consists of five oblong Petals, which ascend, and join so as to form a Helmet, and the under one is bifid. The Nectarium is dependent, and Keel-shaped behind; it hath two short Stamina sitting on the Pointal, with erect Summits fastened to the interior Border of the Nectarium. It hath an oblong, contorted Germen situated under the Flower, with a Style adhering to the inner Border of the Nectarium, crowned by an obsolete Stigma. The Germen afterward turns to an oval, three-cornered, obtuse Capsule, with one Cell opening with three Valves, and filled with small Seeds like Dust.

1. *OPHRYS bulbo fibroso, caule bifolio, foliis ovatis, nectaris labio bifido. Lin. Sp. Plant. 546.* Twyblade with a fibrous Root, two oval Leaves on the Stalk, and a bifid Lip to the Nectarium. This is the *Opbrys bifolia. C. B. P. 87.* Common Twyblade, or Twayblade.

2. *OPHRYS bulbo fibroso, caule bifolio, foliis cordatis. Lin. Sp. Plant. 946.* Twyblade with a fibrous Root, and two Heart-shaped Leaves on the Stalk. This is the *Opbrys minima. C. B. P. 87.* Smallest Twyblade.

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3. OPHRYS *bulbis fibroso fasciculatis, caule vaginato, nectarii labio bifido*. Lin. Sp. Plant. 945. Twyblade with bulbous, bunched Roots having Fibres, a Sheath-like Stalk, and a trifold Lip to the Nectarium. This is the *Orchis abortiva fusca*. C. B. P. 86. Birds Nest, or misshapen Orchis.

4. OPHRYS *bulbis aggregatis oblongis, caule subfolioso, floribus secundis, nectarii labio indiviso*. Ait. Upsal. 1740. Twyblade with oblong, clustered Bulbs, a leafy Stalk, fruitful Flowers, and an undivided Lip to the Nectarium. *Orchis spiralis alba odorata*. J. B. 2. 769. White sweet-scented, spiral Orchis, called Triple Ladies Traces.

5. OPHRYS *bulbo globoso, caule nudo, nectarii labio trifido*. Ait. Upsal. 1740. Twyblade with a globular Bulb, a naked Stalk, and a trifold Lip to the Nectarium. This is the *Orchis odorata moschata, sive monarchis*. C. B. P. 84. Yellow, sweet, or Musk Orchis.

6. OPHRYS *bulbis subrotundis, caule folioso, nectarii labio lineari tripartito, medio elongato bifido*. Lin. Sp. Plant. 948. Twyblade with roundish Bulbs, a leafy Stalk, and a narrow, three-pointed Lip to the Nectarium, the middle Segment of which is stretched out and bifid. This is the *Orchis flore nudi hominis effigiem representans, femina*. C. B. P. 82. Man Orchis.

7. OPHRYS *bulbis subrotundis, caule folioso, nectarii labio subquinguelobo*. Lin. Sp. Plant. 948. Twyblade with roundish Bulbs, a leafy Stalk, and the Lip of the Nectarium divided almost into five Lobes. *Orchis muscam referens major*. C. B. P. 83. Greater Fly Orchis.

8. OPHRYS *bulbis subrotundis, caule folioso, nectarii labio trifido*. Twyblade with roundish Bulbs, a leafy Stalk, and a trifold Lip to the Nectarium. *Orchis fucum referens major, foliis superioribus candidis, aut purpureiscentibus*. C. B. P. 83. Common Humble Bee Orchis.

9. OPHRYS *bulbis subrotundis, caule subfolioso, nectarii labio trifido hirsuto*. Twyblade with roundish Bulbs, a leafy Stalk, and a hairy, trifold Lip to the Nectarium. This is the *Orchis five testiculus sphogodes hirsuto flore*. J. B. 2. 727. Humble Bee Satyrion with green Wings.

The 1st Sort grows naturally in Woods, and moist Pastures, in several Parts of England. The Root is composed of many strong Fibres, from which arise 2 oval, veined Leaves 3 Inches long, and 2 broad joined at their Base; between these arises a naked Stalk about 8 Inches high, terminated by a loose Spike of herbaceous Flowers, resembling Gnats, composed of 5 Petals, with a long, bifid Lip to the Nectarium, with a Crest or Standard above, and 2 Wings on the Side. The Flowers sit on an angular Germen, which afterward swells to a Capsule, opening when ripe in 6 Parts, and filled with small dusty Seeds. This Plant refuses Culture, but may be transplanted, from the Places where it grows naturally, into a shady Part of the Garden, where if the Roots are not disturbed, they will continue several Years, and flower in May, but they do not increase in Gardens. The best Time to remove the Roots, is in July or August, when the Leaves are decaying, for it will be difficult to find the Roots, after the Leaves are gone.

The 2d Sort is found in some of the northern Counties in England, but is seldom seen growing in the South. This hath a small Bulb with many strong Fibres to the Root, and sends out two small, ribbed, Heart-shaped Leaves at Bottom. The Stalk rises about 4 Inches high,

and is terminated by a Spike of small herbaceous Flowers shaped like those of the first Sort.

The 3d Sort grows naturally in shady Woods in Kent and Suffex. This has sometimes a single bulbous Root, and at others several joined together, from which arises a single Stalk near a Foot high, embraced the whole Length with Leaves like Sheaths; the Top of the Stalk is garnished with a loose Spike of Flowers shaped like those of the Orchis, and of the Colour of decayed Leaves. It flowers in June.

The 4th Sort grows upon chalky Hills in England; this hath a globular, bulbous Root, from which arises a single Stalk 6 Inches high, having two oblong Leaves at Bottom, and rarely any above; the Flowers are small, of a yellowish green Colour, growing in a loose Spike on the Top of the Stalk, they have a musky Scent. This flowers in August.

The 5th Sort grows naturally in moist Pastures in the northern Parts of England; I have also found it in great Plenty on Enfield Chase, not far from the Town. This hath many oblong Bulbs joined together at the Top, from which arise 3 or 4 oblong Leaves, and between these comes out a slender Stalk about 6 Inches high, having a few narrow Leaves which embrace it like a Sheath. The Flowers grow in a close Spike at the Top, they are white and have an agreeable Scent. This flowers in August and September.

The 6th Sort grows upon the Chalk Hills near Northfleet in Kent, and also upon Cauxham Hills near Reading; this hath a roundish, bulbous Root, from which come out a few oblong Leaves; the Stalks rise a Foot and Half high, garnished with a few narrower Leaves, the Flowers grow in a loose Spike on the Top of the Stalk, they are of a rusty Iron Colour, sometimes inclinable to green. The Lip of the Nectarium is divided into three Parts, the middle Segment being stretched out much longer than the other, and is divided into two, the upper Part of the Flower being hooded, the whole bears some Resemblance to a naked Man. This flowers in June.

The 7th Sort is commonly called the Fly Orchis. This grows naturally in England, but not in great Plenty. Mr. Ray found it growing on the Banks of the Devil's Ditch in Cambridgeshire. I gathered it near Northfleet in Kent; it hath a roundish, bulbous Root, from which arise 4 or 5 oblong Leaves, and a Stalk about a Foot high, having a few narrow, acute pointed Leaves, embracing it like Sheaths. The Flowers are ranged on the upper Part of the Stalk at a Distance from each other; they have no Spur, the Crest and Wings are of an herbaceous Colour, but the Nectarium is very like the Body of a Fly. It flowers the End of May.

The 8th Sort grows naturally in dry Pastures in several Parts of England, and is commonly called the Humble Bee Orchis; of this there are 2 or 3 Varieties found wild in England, and several more in Spain and Portugal. This hath a roundish, bulbous Root, the Leaves are like those of the narrow-leaved Plantain. The Stalk rises 6 or 7 Inches high, having 2 or 3 Sheath-shaped Leaves embracing it which are erect; at the Top of the Stalk come out 2 or 3 Flowers without Spurs, having purplish Crests and Wings. The Nectarium is large, shaped like the Body of a Humble Bee, of a dark sooty Colour, with 2 or 3 Lines running cross it of a darker or lighter

lighter Colour, which appear brighter or duller according to the Position of the Flower to the Sun. It flowers early in June. There are some Varieties of this Sort, which differ in the Colour and Size of their Flowers.

The 9th Sort grows naturally on the Chalk Hills near Northfleet in Kent, and in several other Places. This is called the green-winged Humble Bee *Orebis*. The Roots of this are roundish, like those of the former Sort, the Leaves are narrower and fewer, the Stalks are shorter, the Flowers a little smaller, the Wings are green, and the Nectarium of a dark sooty Colour, and hairy. This flowers the End of April.

All these Sorts may be preserved in Gardens, though not propagated there. The best Time to remove the Roots from the Places where they naturally grow, is just before the Stalks fall, for at that Time the Roots may be easily discovered, and then they are beginning to rest, so that the Bulb will be fully formed for flowering the following Year, and will not shrink; but when they are removed at a Time of the Year when they are in Action, the Bulb designed for flowering the following Year, not being fully ripened, will shrink, and frequently perish, or if they survive their Removal, do not recover their former Strength in less Time than two Years.

When these are removed into a Garden, the Soil should be adapted to the Sorts. Such of them as grow naturally in moist Pastures, should be planted in shady, moist Borders; those which are Inhabitants of Woods may be planted under Trees in Wildernesses, but such as grow upon Chalk Hills should have a Bed of Chalk prepared for them in an open Situation, and when the Plants are fixed in their several Places, they should not be disturbed after; for if they are kept clean from Weeds, the less the Ground is disturbed, the better the Plants will thrive, and the longer they will continue.

OPUNTIA. Tourn. Inst. R. H. 239. Tab. 122. *Tuna*. Hort. Elt. 295. *Cactus*. Lin. Gen. Plant. 539. [This Plant is called *Opuntia*, because *Theophrastus* writes, that it grows about *Opuntium*.] The Indian Fig, or prickly Pear; in French, *Raquette*.

The Characters are,

The Flower is composed of several Petals, which are obtuse, concave, and placed in a circular Order, sitting upon the Germen. It has a great Number of Awl-shaped Stamina, which are inserted in the Germen, are shorter than the Petals, and terminated by oblong erect Summits. The Germen, which is situated under the Flower, supports a cylindrical Style, the Length of the Stamina, crowned by a multifid Stigma. The Germen turns to a fleshy umbilicated Fruit with one Cell, inclosing many roundish Seeds.

The Species are,

1. *OPUNTIA articulis ovatis compressis, spinis setaceis*. Indian Fig with oval compressed Joints, and bristly Spines. This is the *Opuntia vulgo herbariorum*. J. B. 1. 154. The Common *Opuntia*, or Indian Fig.

2. *OPUNTIA articulis ovato-oblongis, spinis setaceis*. Indian Fig with oblong oval Joints, and bristly Spines. This is the *Opuntia folio oblongo media*. Tourn. Inst. R. H. 239. Middle Indian Fig with oblong Leaves.

3. *OPUNTIA articulis ovato-oblongis, spinis subulatis*. Indian Fig with oblong oval Joints, and Awl-shaped Spines. This is the *Opuntia major, validissimis spinis*

munita. Tourn. Inst. R. H. 239. Greater Indian Fig armed with very strong Spines.

4. *OPUNTIA articulis ovato-oblongis, spinis longissimis nigricantibus*. Indian Fig with oblong oval Joints, and very long black Spines. This is the *Tuna elatior spinis validis nigricantibus*. Hort. Elt. Tab. 194. Taller Indian Fig with strong black Spines.

5. *OPUNTIA articulis ovato-oblongis crassissimis, spinis inaequalibus*. Indian Fig with oblong, oval, thick Joints, and unequal Spines. This is the *Opuntia maxima, folio spinoso, latissimo & longissimo*. Tourn. Inst. 240. Greatest Indian Fig with the longest and broadest prickly Leaf.

6. *OPUNTIA articulis ovato-oblongis subinermibus*. Indian Fig with oblong oval joints, almost without Spines. This is the *Opuntia maxima, folio oblongo-rotundo majore, spinulis mollibus & innocentibus obsito, flore striis rubris variegato*. Sloan. Cat. Jam. 194. Greatest Indian Fig with a larger oblong round Leaf, armed with soft innocent small Spines, and a Flower variegated with red Stripes, commonly called, the Cochineal Fig.

7. *OPUNTIA articulis cylindrico-ventricosus compressis, spinis setaceis*. Indian Fig with compressed, cylindrical, bellied Joints, and bristly Spines. This is the *Ficus Indica, seu Opuntia curassavica minima*. Hort. Amst. 1. 107. Indian Fig, or the least *Opuntia* of *Curassao*, frequently titled Pinpillow.

8. *OPUNTIA articulis longissimis tenuibus compressis, spinis longissimis confertissimis, gracilibus albicantibus armatis*. Houst. Mss. Stalky Indian Fig, with large, narrow, compressed Leaves, armed with the longest, narrowest, white Spines, growing in Clusters; this is by the Gardeners called, *Robinson Crusoe's Coat*.

9. *OPUNTIA prolifer ensiformi-compressus serrato-repandus*. Indian Fig with compressed Sword-shaped Joints, whose Indentures turn backward. This is the *Cereus scolopendri folio brachiato*. Hort. Elt. 73. Tab. 64. Torch Thistle with a branching Spleenwort Leaf.

These Plants are all Natives of America, though the first Sort is found growing wild on the Sides of the Roads about Naples, in Sicily, and Spain, but it is probable that the Plants may have been brought from America thither, at first. This Sort has been long in the English Gardens; the Joints or Branches are oval, or roundish, compressed on their two Sides flat, and have small Leaves coming out in Knots on their Surface, also on their upper Edges, which fall off in a short Time; and at the same Knots there are 3 or 4 short bristly Spines, which do not appear unless they are closely viewed; but on being handled, they enter the Flesh, and separate from the Plant, so are troublesome, and often very difficult to get out of the Flesh. The Branches spread near the Ground, and frequently trail on it, putting out new Roots, so are extended to a considerable Distance, and never rise in Height; these are fleshy and herbaceous while young, but as they grow old become drier, of a tough Contexture, and have ligneous Fibres: The Flowers come out on the upper Edges of the Branches, generally, though sometimes they are produced on their Sides; these sit upon the Embryo of the Fruit, and are composed of several roundish concave Petals which spread open; they are of a pale yellow Colour, and within arise a great Number of Stamina, fastened to the Embryo of the Fruit, which are terminated by oblong Summits

Summits; in the Center is situated the Style, crowned by a many-pointed Stigma; after the Flowers are past, the Embryo swells to an oblong Fruit, whose Skin, or Cover, is set with small Spines in Clusters, and the Inside is fleshy, of a purple, or red Colour, in which are lodged many black Seeds. This Plant flowers here in July and August, but unless the Season is very warm, the Fruit will not ripen in England.

I received some Branches of this Sort from Mr. Peter Collinson, F. R. S. who assured me they were sent him from Newfoundland, where the Plants grow naturally, which is much farther to the North than it was before known to grow, and how it endures the Cold of that Country is inconceivable, for though the Plants will live-abroad in England, in a warm Situation and a dry Soil, yet, in severe Winters, they are generally destroyed, if not protected from the Frost.

The 2d Sort hath oblong, oval, compressed Branches, which grow more erect than those of the 1st, and armed with longer bristly Spines, which come out in Clusters from a Point on each of the compressed Sides, spreading open like the Rays of a Star. The Flowers grow upon the Embryo of the Fruit, which come out from the upper Edges of the Leaves like the first, but are larger, and of a brighter yellow Colour. The Fruit is also larger, and of a deeper purple Colour, the outer Skin is also armed with longer Spines; this is the most common Sort in Jamaica, and upon the Fruit of this the wild Sort of Cochineal feeds, which is called *Sylvestris*. Some of the Plants were sent me with the live Insects upon them from Jamaica, by the late Dr. Housloun, who was writing a History of these Insects, at the Time he was taken ill and died; these Insects kept alive upon the Plants here, for 3 or 4 Months, but afterward perished. If the Fruit of this Plant is eaten, it will dye the Urine of a bloody Colour.

The 3d Sort hath stronger Branches than the 2d, which are armed with larger Thorns, of an Awl-shape; they are whitish, and come out in Clusters like the other Sort. The Flowers are large, of a bright yellow Colour, and the Fruit is shaped like the 2d Sort.

The 4th Sort grows taller than either of the former; the Branches are larger, thicker, of a deeper green, and are armed with strong black Spines, which come out in Clusters like the other Sorts, but the Clusters are farther asunder. The Flowers are produced from the upper Edges of the Branches; they are smaller than those of the other Sorts, and are of a purplish Colour, as are also the Stamina; the Fruit is of the same Form as those of the first, but do not ripen here.

The 5th Sort is the largest of all the Sorts yet known. The Joints are more than a Foot long, and 8 Inches broad; they are very thick, of a deep green Colour, and armed with a few short bristly Spines; the older Branches often become almost taper, and are very strong. The Flowers I have never yet seen; for although I have had many of the Plants more than 10 Feet high, none of them has produced Flowers.

The 6th Sort has been always supposed to be the Plant, on which the Cochineal Insects feed; this hath oblong, smooth, green Branches, which grow erect, and rise to the Height of 8 or 10 Feet, having scarce any Spines on them, and those few which are, can scarce be discerned

at a Distance, and are so soft as not to be troublesome when handled. The Flowers are small, and of a purple Colour, standing upon the Embryo of the Fruit, as those of the other Sort, but do not expand open like them. The Flowers appear late in Autumn, and the Fruit drops off in Winter, without coming to any Perfection here; this Sort is cultivated in the Fields of New Spain, for the Increase of the Insects, but it grows naturally in Jamaica, where it is probable the true Cochineal might be discovered, if Persons of Skill were to search after the Insects.

The 7th Sort grows naturally at Curassao; this hath cylindrical swelling Joints, closely armed with slender white Spines. The Branches spread on every Side, and where they have no Support, fall to the Ground, often separating at the Joints from the Plants, and, as they lie upon the Ground, put out Roots, so form new Plants; this Sort rarely produces Flowers in England. In the West-Indies it is called Pinpillow, from the resemblance of the Branches to a Pin Cushion stuck full of Pins.

The 8th Sort was sent me from Jamaica, by Dr. Housloun, who found it there in great Plenty, but could never observe either Fruit or Flower upon any of the Plants, nor have any of them produced either in England. The Branches of this have much longer Joints than any of the other; they are narrower, and more compressed. The Spines are very long, slender, and of a yellowish, brown Colour, coming out in Clusters all over the Surface of the Branches, crossing each other, so as to render it dangerous to handle, for upon being touched, the Spines adhere to the Hand, quit the Branches, and penetrate into the Flesh.

The 9th Sort grows naturally in the Brazil; this hath very thin Branches, indented regularly on their Edges, like Spleenwort; they are of a light green, and shaped like a broad Sward; these are smooth, having no Spines. The Flowers come out from the Side and End of the Branches, sitting on the Embryos as the other Sorts; they are of a pale yellow. The Fruit is shaped like the 1st Sort, but rarely ripens in England.

All these Sorts (except the first) are too tender to thrive in the open Air in England; nor can many of them be preserved through the Winter here, unless they have artificial Heat; for when they are placed in a Green-house, they turn to a pale yellow Colour, their Branches shrink, and frequently rot on the first Approach of warm Weather in the Spring.

These Plants may all be propagated by cutting off their Branches at the Joints, during any of the Summer Months, which should be laid in a warm dry Place for a Fortnight, that the wounded Part may be healed over, otherwise they will rot with the Moisture which they imbibe at that Part, as is the Case with most other succulent Plants. The Soil in which these Plants must be planted, should be composed after the following Manner, viz. one Third of light fresh Earth from a Pasture, a third Part Sea Sand, and the other Part should be one Half rotten Tan, and the other Half Lime Rubbish; these should be well mixed, and laid in a Heap three or four Months before it is used, observing to turn it over at least once a Month, that the several Parts may be well united; then you should pass it through a rough Screen, in order to separate the largest Stones and Clods, but by no Means sift it too fine, which is a very common Fault;

Fault; then you should reserve some of the smaller Stones and Rubbish to lay at the Bottom of the Pots, in order to keep an open passage for the Moisture to drain off, which is what must be observed for all succulent plants, for if the Moisture be detained in the Pots, it will rot their Roots, and destroy the Plants.

When you plant any of the Branches of these Plants (except the first Sort) plunge the Pots into a moderate hot Bed, which will greatly facilitate their taking Root; also refresh them now and then with a little Water, but be very careful not to let them have too much, or be too often watered, especially before they are rooted. When the plants begin to shoot, give them a large Share of Air, by raising the Glasses, otherwise their Shoots will draw up so weak, as not to be able to support themselves; after they have taken strong Root inure them to the Air by Degrees, and then remove them into the Stove where they should remain, placing them near the Glasses, which should always be opened in warm Weather; so that they may have the Advantage of a free Air, and yet be protected from Wet and Cold.

During Summer these Plants will require to be often refreshed with Water, but not in large Quantities, lest it rot them, and in Winter this should be proportioned to the Warmth of the Stove, for if the air be kept very warm, they will require to be often refreshed, otherwise their Branches will shrink, but if the House be kept in a moderate Degree of Warmth, they should have but little, for Moisture at that Season will rot them very soon.

The Heat in which these Plants thrive best, is the temperate Point, as marked on Botanical Thermometers, for if they are kept too warm in Winter, it causes their Shoots to be very tender, weak, and unsightly. Those Sorts which are inclinable to grow upright, should have their Branches supported with Stakes, otherwise their great Weight will break them down.

These Plants are by most people exposed to the open Air in the Summer Season, but they thrive much better if they are continued in the Stoves, provided the Glasses be kept open, so that they may have free Air; for when they are set abroad, the great Rains which generally fall in Summer, together with the unsettled Temperature of the Air in our Climate, greatly diminish their Beauty, by retarding their Growth; and sometimes in wet Summers they are so replete with Moisture, as to rot the succeeding Winter; nor will those Plants which are set abroad (I mean the tender Sorts) produce their Flowers and Fruit in such Plenty, as those which are constantly preserved in the House.

ORANGE. See Aurantium.

ORCHARD. In planting an Orchard, great Care should be had to the Nature of the Soil, and such Sorts of Fruits only should be chosen, as are best adapted to the Ground designed for planting, otherwise there can be little Hopes of succeeding; and it is for want of rightly observing this, that we see in many Countries Orchards planted, which never arrive to any tolerable Degree of Perfection; their Trees starving, and their Bodies either covered with Moss, or the Bark cracked and divided, both which are evident Signs of the Weakness of the Trees; whereas, if instead of Apples the Orchard had been planted with Pears, Cherries, or any

other Sort of Fruit better adapted to the Soil, the Trees might have grown very well, and produced great Quantities of Fruit.

As to the Position of the Orchard, (if you are at full Liberty to choose) a rising Ground, open to the South-east, is to be preferred; but I would by no Means advise planting on the Side of a Hill, where the Declivity is very great; for in such Places the great Rains wash down the best Part of the Ground, whereby the Trees are deprived of proper Nourishment; but where the Rise is gentle, it is of great Advantage to the Trees by admitting the Sun and Air between them, better than an entire Level, which is of exceeding Benefit to the Fruit, by dissipating Fogs and drying up the Damps, which, when detained among the Trees, mix with the Air and render it rancid; if it be defended from the West, North, and East Winds, it will render the Situation still more advantageous, for it is chiefly from those Quarters that Fruit Trees receive the greatest Injury; therefore, if the Place be not naturally defended from these by rising Hills (which is always to be preferred,) then you should plant large growing Timber Trees at some Distance from the Orchard, to answer this Purpose.

You should also have great Regard to the Distance of planting the Trees, which very few have rightly considered; for if you plant them too close, they will be liable to Blights; the Air being hereby pent in among them, will cause the Fruit to be ill tasted, having a great Quantity of damp Vapours from the Perspiration of the Trees, and the Exhalations from the Earth mixed with it, which will be imbibed by the Fruit, and render their Juices crude and unwholesome.

Wherefore I cannot but recommend the Method lately practised by some Gentlemen with very good Success, and that is, to plant the Trees fourscore Feet asunder, but not in regular Rows. The Ground between the Trees they plough and sow with Wheat and other Crops, in the same Manner as if it were clear from Trees; and they observe their Crops to be full as good as those quite exposed, except just under each Tree, when they are grown large, and afford a great Shade; and by thus ploughing and tilling the Ground, the Trees are rendered more vigorous and healthy, scarcely ever having any Moss, or other Marks of Poverty, and will abide much longer and produce better Fruit.

If the Ground which you intend for an Orchard has been pasture for some Years, then plough in the green Sward the Spring before you plant the Trees; and if you will permit it to lie a Summer fallow, it will greatly mend it, provided you stir it 2 or 3 times, to rot the Sward of Grass, and prevent Weeds growing thereon.

At Michaelmas plough it pretty deep, in order to make it loose for the Roots of the Trees, which should be planted in October, provided the Soil be dry; but if it be moist, the Beginning of March will be a better Season. The Distance, if designed for a close Orchard, must not be less than 40 Feet, but the Trees planted twice that Distance will succeed better.

When you have finished planting the Trees, support them with stakes, otherwise the Wind will blow them out of the Ground; which will do them much Injury, especially after they have been planted some Time; for the Ground in Autumn being warm and moist, the

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Trees will very soon push out a great Number of young Fibres; which, if broken off by their being displaced, will greatly retard the Growth of the Trees.

In the Spring following, if the Season should prove dry, lay a Quantity of green Sward, on the Surface of the Ground about their Roots, turning the Grass downward, which will prevent the Sun and Wind from drying the Ground, whereby a great Expence of Watering will be saved; but after the first Year they will be out of Danger, provided they have taken well.

Whenever you plough the Ground between the Trees, be careful not to go too deep among their Roots, lest you cut them off, which would greatly damage the Trees; but if you do it cautiously, the stirring the Surface of the Ground will be of great Benefit to them; observe never to sow too near the Trees, nor suffer any great rooting Weeds to grow about them, which would exhaust the Goodness of the Soil, and starve them.

If after the Turf which was laid round the Trees be rotted, you dig it in gently about the Roots, it will greatly encourage them.

Some Persons plant many Sorts of Fruit together in the same Orchard, mixing the Trees alternately; but this is a Method which should always be avoided, for there will be a great Difference in the Growth of the Trees, which will not only render them unsightly, but also the Fruit upon the lower Trees ill tasted, by the tall ones overshadowing them; so that if you are determined to plant several Sorts of Fruit on the same Spot, observe to place the largest growing Trees backward, and so proceed to those of less Growth, continuing the same Method through the whole Plantation; whereby it will appear at a Distance in a regular Slope, the Sun and Air will more equally pass through the whole Orchard, and every Tree have equal Benefit therefrom; but this can only be practised on good Ground, in which most Sorts of Fruit Trees will thrive.

The Soil of your Orchard should be mended once in 2 or 3 Years with Dung, or other Manure, which will also be absolutely necessary for the Crops sown between; so that those who are not inclinable to help their Orchards, where the Expence of Manure is great, yet, as a Crop is expected from the Ground besides the Fruit, they will the more readily be at the Charge on that Account.

In making Choice of Trees for an Orchard, always observe to procure them from a Soil nearly akin to that where they are to be planted, or rather poorer; for if you have them from a very rich Soil, and that wherein you plant them is indifferent, they will not thrive well, especially for 4 or 5 Years after planting; it is a very wrong Practice to make the Nursery where young Trees are raised very rich, when they are designed for a middling or poor Soil. The Trees should also be young and thriving, for whatever some may advise to the contrary, yet it has always been observed, that though large Trees may grow and produce Fruit after being removed, they never make so good Trees, nor are so long lived, as those which are planted while young.

These Trees, after they are planted out, require no other pruning, but only to cut out dead Branches, or such as cross each other, which renders their Heads confused and unsightly: The pruning them too often, or

shortening their Branches, is very injurious; especially to Cherries and Stone Fruit, which gum prodigiously, and decay in such Places where they are cut; Apples and Pears, which are not of so nice a Nature, will produce a greater Quantity of lateral Branches, which will fill the Heads of the Trees with weak Shoots, whenever their Branches are thus shortened; and many Times the Fruit is hereby cut off, which, on many Sorts of Trees, is first produced at the Extremity of their Shoots.

It may, perhaps, seem strange to some, that I should recommend allowing so much Distance to the Trees in an Orchard, because a small Piece of Ground will admit of very few Trees when planted in this Method; but they will please to observe, that when the Trees are grown up, they will produce a great deal more Fruit, than twice the Number planted close, and will be vastly better tasted; the Trees when placed at a large Distance, being never so much in Danger of blighting as in close Plantations, as hath been observed in *Herefordshire*, the great County for Orchards, where they find, that when Orchards are so planted or situated, that the Air is pent up among the Trees, the Vapours which arise from the Damp of the ground, and Perspiration of the Trees, collect the Heat of the Sun, and reflect it in Streams so as to cause what they call a Fire Blast, which is the most hurtful to Fruits; and this is most frequent where the Orchards are open to the South Sun.

But as Orchards should never be planted, unless where large Quantities of Fruit are desired, so it will be the same Thing to allow twice or three Times the Quantity of Ground since there may be a Crop of Grain of any Sort upon the same Place (as was before said), so that there is no Loss of Ground; and for a Family only it is hardly worth while to plant an Orchard; since a Kitchen Garden well planted with Espaliers will afford more Fruit than can be eaten while good, especially if the Kitchen Garden be proportioned to the Largeness of the Family; and if Cyder be required, there may be a large Avenue of Apple Trees extended cross a neighbouring Field, which will render it pleasant, and produce a great Quantity of Fruit; or there may be some single Rows of Trees planted to surround Fields, &c. which will fully answer the same Purpose, and be less liable to the Fire Blasts before mentioned.

ORCHIS. *Tourn. Inst. R. H.* 431. *Tab.* 248 & 249. *Lin. Gen. Pl.* 900. Satyrion, or Fool-stones.

The Characters are,

It hath a single Stalk with a vague Sheath, it has no Empalement. The Flower hath 5 Petals, 3 without and 2 within, which rise and join in a Standard. The Nectarium, is of one Leaf fixed to the Side of the Receptacle, between the Division of the Petals. The upper Lip is short and erect, the under large, broad, and spreading; the Tube is pendulous, Horn-shaped, and prominent behind. It hath 2 short slender Stamina sitting upon the Pointal, with oval erect Summits, fixed in the upper Lip of the Nectarium. It hath an oblong contorted Germen under the Flower, with a short Style fastened to the upper Lip of the Nectarium, crowned by an obtuse compressed Stigma. The Germen afterward turns to an oblong Capsule with one Cell, having 3 Keel-shaped Valves, opening on the 3 Sides, but joined at Top and Bottom, filled with small Seeds like Dust.

The Species are,

ORC

1. ORCHIS bulbis indivisis, nectarii labio quadrifido crenulato, cornu obtuso. Aët. Upsal. 1740. Orchis with undivided Bulbs, the Lip of the Nectarium cut into 4 Points slightly indented, and an obtuse Horn. This is the Orchis morio fœmina. Common female Orchis.

2. ORCHIS bulbis indivisis, nectarii labio æquali, cornu integro, galeæ alis reflexis acutis. Orchis with undivided Bulbs, the Lip of the Nectarium equal, an entire Horn, and the Wings of the Standard acute and reflexed. This is the Orchis morio mas, foliis maculatis. C. B. P. 81. The male Orchis with spotted Leaves.

3. ORCHIS bulbis indivisis, nectarii labio lanceolato integerrimo, cornu longissimo, petalis patentibus. Aët. Upsal. 1740. Orchis with undivided Bulbs, the Lip of the Nectarium entire and Spear-shaped, a very long Horn, and Petals spreading very wide. Orchis alba bifolia minor, calcar oblongo. C. B. P. 83. Smaller white two-leaved Orchis, with an oblong Spur, or Butterfly Orchis.

4. ORCHIS bulbis indivisis, nectarii labio quinquefidis punctis scabro, cornu obtuso, petalis confluentibus. Aët. Upsal. 1740. Orchis with undivided Bulbs, a five-pointed Lip to the Nectarium; having rough Spots, an obtuse Horn, and Petals running together. Orchis latifolia, biantecuculla major. Tourn. The Man Orchis.

5. ORCHIS bulbis indivisis, nectarii labio trifido antice bidentato, cornu longo, petalis acuminatis. Aët. Upsal. 1740. Orchis with undivided Bulbs, a trifid Lip to the Nectarium, indented with 2 Teeth behind, a long Horn, and acute-pointed Petals. Orchis militaris, montana, spicâ rubente, conglomeratâ. Tourn. Mountain military Orchis, with a redish conglomerated Spike.

6. ORCHIS bulbis indivisis, nectarii labio quadrifido punctis scabro, cornu obtuso, petalis distinctis. Aët. Upsal. 1740. Orchis with undivided Bulbs, the Lip of the Nectarium quadrifid, and having rough Spots, an obtuse Horn, and distinct Petals. Orchis Pannonica iv. Clus. Hist. The fourth Pannonian Orchis of Clusius.

7. ORCHIS bulbis subpalmatis rectis, nectarii cornu conico, labio trilobo, lateribus reflexo, bracteis flore longioribus. Aët. Upsal. 1740. Orchis with straight, palmated, bulbous Roots, a conical Horn to the Nectarium, the Lip cut into 3 Lobes, reflexed on the Sides, and Bractees longer than the Flowers. This is the Orchis palmata pratensis, latifolia, longis calcaribus. C. B. P. 85. Broad-leaved, Meadow, handed Orchis, having a long Spur.

8. ORCHIS bulbis palmatis patentibus, nectarii cornu germinibus brevior, labio plano petalis dorsalibus erectis. Aët. Upsal. 1740. Orchis with handed spreading Bulbs, the Horn of the Nectarium shorter than the Germen, a plain Lip, and the hinder Part of the Petals erect. This is the Orchis palmata pratensis, maculata. C. B. P. 85. Meadow, handed Orchis, with spotted Leaves.

9. ORCHIS bulbis palmatis, nectarii cornu setaceo germinibus longiore, labio crenato. Aët. Upsal. 1740. Orchis with palmated Bulbs, a bristly Horn to the Nectarium, which is longer than the Germen, and a crenated Lip. Orchis palmata minor, calcaribus oblongis. C. B. Smaller palmated Orchis, with an oblong Spur to the Flower.

10. ORCHIS bulbis fasciculatis filiformibus, nectarii labio ovato integerrimo. Aët. Upsal. 1740. Orchis with Thread-like Bulbs growing in Bunches, and the Lip of the Nectarium oval and entire. This is the Limodorum Austriacum. Clus. Pan. 241. Purple Bird's Nest.

ORC

The 1st Sort grows naturally in Pastures, in most Parts of England. This hath a double bulbous Root, with some Fibres coming out from the Top; it has 4 or 6 oblong Leaves lying on the Ground, which are reflexed. The Stalk rises 9 or 10 Inches high, having 4 or 6 Leaves which embrace it; this is terminated by a short loose Spike of Flowers, having a four-pointed indented Lip to the Nectarium, and an obtuse Horn. The Flowers are of a pale purple Colour, marked with deeper purple Spots; it flowers in May.

The 2d Sort grows naturally in Woods and shady Places in many Parts of England; this hath a double bulbous Root, which is about the Size and Shape of middling Olives; it hath 6 or 7 long broad Leaves, shaped like those of Lilies, which have several black Spots on their upper-Side; the Stalk is round, and a Foot high, having one or two smaller Leaves embracing it. The Flowers are disposed in a long Spike on the Top of the Stalk, they are of a purple Colour, marked with deep purple Spots, and have an agreeable Scent. It flowers the latter End of April.

The 3d Sort grows naturally under Bushes by the Side of Pastures, in England. This hath a Root composed of 2 oblong, Pear-shaped Bulbs, from which come out 3 or 4 Lily-shaped Leaves, of a pale green, with a few faint Spots; the Stalk rises near a foot high, it is slender, furrowed, and has a few very small Leaves which embrace it; this is terminated by a loose Spike of white Flowers smelling sweet, which resemble a Butterfly with expanded Wings. It flowers in June.

The 4th Sort is found growing naturally on Causham Hills, and in other Places where the Soil is Chalk. The Roots are composed of 2 Bulbs, from which come out 4 or 5 oblong Leaves; the Stalk is about 9 Inches high, sustaining a loose Spike of sweet smelling Flowers, each hanging on a pretty long Foot Stalk; they have a short obtuse Horn, a Crest and Wings, of an Ash Colour without, reddish within, and striped with deeper Lines; the Lip is oblong, divided into 5 Parts, having rough Spots. This flowers in June.

The 5th Sort grows naturally on Chalk Hills in several Parts of England; the Root is composed of 2 oblong Bulbs, from which arise 3 or 4 narrow oblong Leaves; the Stalk rises a Foot high, having 3 or 4 narrow erect Leaves which embrace it. The Flowers are produced in a thick, roundish Spike at the Top, they are of a reddish Colour, having long Spurs, and the Wings are acute-pointed. It flowers in June.

The 6th Sort grows naturally on dry Pastures in England; this hath a double bulbous Root, the Leaves are oblong and narrow; the Stalk rises 6 or 7 Inches, having 2 or 3 Leaves which embrace it like Sheaths. The Flowers grow in close short Spikes at the Top of a purple Colour; the Lip of the Nectarium is divided into 4 Parts, having rough Spots; the Spur is obtuse, and the Petals distinct. There is a Variety of this with a white Nectarium. It flowers in June.

The 7th Sort grows naturally in moist Meadows in England; the Root is composed of 2 fleshy Bulbs divided into 4 or 5 Fingers, so as to resemble an open Hand; the Stalk rises from 9 Inches to a Foot high, garnished with Leaves the whole Length, which are 3 or 4 Inches long and one broad, embracing the Stalk with their Base;

Base; these are not spotted, and end in acute Points. The Flowers are disposed in a Spike on the Top of the Stalk, with small narrow Leaves (called Bractææ) between them which are longer than the Flowers. The Spur is half an Inch long, extended backward; the Lip of the Nectarium is broad, divided into 3 Lobes, 2 Side ones being reflexed; the Flowers and Bractææ are of a purplish Colour, having deep purple Spots. It flowers in *May*. There are 2 Varieties of this, differing in the Colour of their Flowers, and one with a narrower Leaf.

The 8th Sort grows naturally in moist Meadows in *England*; the Root is composed of 2 broad fleshy Bulbs, both of which are divided into 4 Fingers, which spread asunder. The Stalk rises 18 Inches high, and is very strong, inclining to a purple Colour; it is garnished with Leaves the whole Length, those on the lower Part of the Stalk are 6 Inches long, and an Inch and Half broad, embracing it with their Base. The Flowers are collected in a close Spike at the Top of the Stalk, of a pale purple Colour; the Spur is about a third Part of an Inch long; the Beard of the Nectarium is plain, and divided into 3 Parts, which is marked with deep purple Spots; under each Foot Stalk is placed a narrow Leaf (or Bractæa) of a purplish Colour. The Leaves and Stalks of the Plant have many dark Spots. It flowers in *June*. There are 2 or 3 Varieties of this, which differ in the Colour of their Flowers.

The 9th Sort grows naturally in moist Meadows in several Parts of *England*; this hath a double-handed Root, that which sustains the Stalk being wasting and decaying, but the other is full, succulent, and plump; the Fingers which compose the Root are long, and spread asunder; the lower Leaves are 6 or 7 Inches long, they are narrow, of a pale green, and have no Spots. The Stalk rises a Foot high, it is garnished with a few narrow short Leaves, which embrace it like Sheaths; it is terminated by a beautiful Spike of red Flowers 6 Inches long, the Flowers are not marked with any Spots; they have long slender bristly Spurs like Birds Claws, being crooked; the Lip of the Nectarium is indented on the Edge. It flowers in *June*.

The 10th Sort grows naturally in shady Woods in *England*, particularly in *Suffex* and *Hampshire*, where I have several Times found it. The Root is composed of many thick, oblique, long Fibres, which are fleshy; the Stalk rises near 2 Feet high, wrapped round with Leaves like Sheaths; these are of a purple Colour. The Flowers are disposed in a loose Thyse at the Top of the Stalk, they are of a purple Colour having an oval entire Lip to the Nectarium, the Crest terminating in a Horn. It flowers in *June*.

All these Sorts of *Orcis* grow wild in several Parts of *England*, but, for the extreme Oddness and Beauty of their Flowers, deserve a Place in every good Garden; and the Reason for their not being cultivated in Gardens, proceeds from their Difficulty to be transplanted; though this, I believe, may be easily overcome, where a Person has an opportunity of marking their Roots in their Time of flowering and letting them remain until their Leaves are decayed, when they may be transplanted with Safety; for it is the same with most Sorts of bulbous or fleshy rooted Plants, which,

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if transplanted before their Leaves decay, seldom live, notwithstanding you preserve a large Ball of Earth about them; for the extreme Parts of their Fibres extend to a great Depth in the Ground, from whence they receive their Nourishment; which, if broken or damaged by taking up their Roots, seldom thrive after; for though they may sometimes remain alive a Year or two, yet they grow weaker until they quite decay; which is also the Case with Tulips, Fritillarias, and other bulbous Roots, when removed, after they have made Shoots; so that whoever would cultivate them, should search them out in their Season of flowering, and mark them; and when their Leaves are decayed, or just as they are going off, the Roots should be taken up, and planted in a Soil and Situation as nearly resembling that wherein they naturally grow, as possible, otherwise they will not thrive, so that they cannot be placed all in the same Bed; for some are only found upon chalky Hills, others in moist Meadows, and some in shady Woods, or under Trees; but if their Soil and Situation be adapted to their various Sorts, they will thrive and continue several Years, and, during their Season of flowering, will afford as great Varieties as any Flowers which are at present cultivated.

The other Sorts not here enumerated, may be found under the following Articles, *Ophrys*, *Satyrion*, *Serapias*. OREOSELINUM. See *Athamanta*.

ORIGANUM. *Lin. Gen. Plant.* 645. *Tourn. Inst.* [of *Opisyon*, of *ἵος*, a Mountain, and *ῥανισμα*, to rejoice, q. d. a Plant that delights to grow on Mountains.] Origanum or Pot Marjoram; in *French*, *Origan*.

The Characters are,

The Flower is of the Lip Kind, having a cylindrical, compressed Tube; the upper Lip is plain, erect, obtuse, and indented, the under Lip is trifid, the Segments being nearly equal. These are disposed in Spikes, composed of oval, coloured Leaves, placed over each other like the Scales of Fish. The Flowers have 4 slender Stamina, 2 being as long as the Petal, the other 2 are longer, terminated by simple Summits; they have a 4 cornered Germen, supporting a slender Style inclining to the upper Lip, crowned by a bifid Stigma. The Germen turns to 4 Seeds shut up in the Empelement of the Flower.

The Species are,

1. ORIGANUM *spicis subrotundis paniculatis conglomeratis, bracteis calyce longioribus ovatis. Lin. Sp. Plant.* 590. Pot Marjoram with roundish, paniculated Spikes gathered in Clusters, and oval Bractææ which are longer than the Empelement. This is the *Origanum vulgare spontaneum*. *I. B.* 2. 236. Common wild Origanum.

2. ORIGANUM *spicis longis pedunculis aggregatis, bracteis, longitudine calycum. Lin. Gen. Plant.* 589. Origanum with long Spikes growing in Bunches, and Bractææ as long as the Empelement. *Origanum beracteotium, culina Gallinacea Plinii. C. B. P.* Winter sweet Marjoram.

3. ORIGANUM *spicis oblongis paniculatis conglomeratis, foliis ovatis glabris.* Origanum with oblong Spikes of Flowers growing in clustered Panicles, and oval, smooth Leaves. *Origanum humilium latifolium glabrum. Tourn. Inst.* Low, broad-leaved, smooth Origanum.

4. ORIGANUM *caule repente, spicis oblongis conglomeratis, bracteis florum longioribus.* Origanum with a creeping

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ing Stalk, and oblong Spikes of Flowers growing in Clusters, with Bractæ longer than the Flower. *Origanum sylvestre, humile*. C. B. P. Low, wild Origany.

5. *ORIGANUM caule erecto ramoso, foliis ovatis rugosis, spicis subrotundis conglomeratis, bracteis calycum brevioribus*. Origany with an erect, branching Stalk, oval, rough Leaves, roundish Spikes of Flowers growing in Clusters, with Bractæ shorter than the Empalement. This is the *Origanum Orientale prunella folio glauco, flore purpureo*. Boerb. Ind. Alt. 1. 179. Eastern Origany with a gray Self-heal Leaf, and a purple Flower.

6. *ORIGANUM spicis aggregatis longis prismaticis rectis, bracteis membranaceis, calyce duplo longioribus*. Lin. Sp. Plant. 589. Origany with long, upright, prismatical Spikes growing in Clusters, and membranaceous Bractæ twice the Length of the Empalement. This is the *Origanum Creticum*. C. B. P. 223. Origany of Crete.

7. *ORIGANUM foliis ovalibus obtusis, spicis subrotundis compactis pubescentibus*. Hort. Cliff. 304. Origany with oval, obtuse Leaves, and roundish, compact, hairy Spikes. This is the *Majorana vulgaris*. C. B. P. 224. Common, or sweet Marjoram.

8. *ORIGANUM foliis carnosissimis tomentosis*. Lin. Sp. Plant. 588. Origany with fleshy, woolly Leaves. *Majorana rotundifolia, scutellata, exotica*. H. R. Par. Round-leaved, foreign Marjoram with a Spoon-shaped Leaf.

9. *ORIGANUM foliis ovatis acutè serratis, spicis congestis umbellatim fastigiatis*. Hort. Cliff. 304. Origany with oval Leaves acutely sawed, and Spikes of Flowers disposed in umbellated Bunches. This is the *Origanum Smyrneum*. Wheel. Raii. Hist. 450. Origany of Smyrna.

10. *ORIGANUM foliis omnibus tomentosis, spicis nutantibus*. Origany with all the Leaves woolly, and nodding Spikes of Flowers. This is the *Diastamus Creticus*. C. B. P. 222. The Dittany of Crete.

11. *ORIGANUM foliis omnibus glabris, spicis nutantibus*. Hort. Cliff. 304. Origany with all the Leaves smooth, and nodding Spikes of Flowers. This is the *Diastamus montis Sipylis origani foliis*. Flor. Bat. 2. 79. Dittany of Mount Sipylus with an Origany Leaf.

12. *ORIGANUM foliis inferioribus tomentosis, spicis nutantibus*. Hort. Cliff. 304. Origany with the under Leaves hoary, and nodding Spikes of Flowers. This is the *Origanum Diastamni Cretici facie, folio crasso, nunc villosa, nunc glabra*. Tourn. Origany like Dittany of Crete, and thick Leaves sometimes hairy, at others smooth.

13. *ORIGANUM spicis oblongis aggregatis hirsutis, foliis cordatis tomentosis*. Lin. Sp. Plant. 590. Origany with oblong, hairy Spikes growing in Bunches, and Heart-shaped, woolly Leaves. *Origanum lignosum Syracusanum perenne, umbellâ amplissimâ brevi, lato & nervoso folio*. Bocc. Mus. Ligneous, perennial Origany of Syracuse with a short, ample Umbel, and a broad, veined Leaf.

The 1st Sort grows naturally in Thickets, and among Bushes in several Parts of England; the Root is perennial, composed of many small ligneous Fibres. The Stalks are square, and rise near 2 Feet high, they are ligneous, and garnished with oval Leaves placed by Pairs at each Joint, from the Wings of these come out 3 or 4 smaller Leaves on each Side, which resemble

those of *Marjoram*, sitting close to the Stalk; they have an aromatick Scent; the Flowers are produced in roundish Spikes growing in Panicles at the Top of the Stalks, many of the Spikes being gathered together; the Flowers are of a Flesh Colour, and peep out of their scaly Covering. Their upper Lip is cut into two, standing erect, and the lower Lip or Beard is divided into three, and is turned downward; the Stamina stand out a little beyond the Petals, and are of a purplish Colour. It flowers in June and July, and the Seeds ripen in Autumn. This Sort is sometimes cultivated in Gardens, and is by some called Pot Marjoram, it is used in Soups.

It will rise plentifully from scattered Seeds, or it may be propagated by parting the Roots; the best Time for this is in Autumn, it may be planted in any Soil not over-moist, and will thrive in any Situation, so requires no Care, but to keep it clear from Weeds. There is a Variety of this with white Flowers, and light green Stalks, and another with variegated Leaves.

The 2d Sort is now commonly known by the Title of Winter sweet Marjoram, though this was formerly stiled Pot Marjoram. This hath a perennial Root, from which arise many branching Stalks 18 Inches high; they are four-cornered, hairy, and inclining to a purplish Colour, garnished with oval, obtuse, hairy Leaves, resembling greatly those of sweet Marjoram, standing opposite by Pairs on short Foot Stalks; the Flowers are disposed in Spikes about 2 Inches long, several arising together from the Divisions of the Stalk. They are small, white, and peep out of their scaly Covers; these appear in July, and the Seeds ripen in Autumn. It grows naturally in Greece and the warm Ports of Europe, but is hardy enough to thrive in the open Air in England, and is chiefly cultivated for Nosegays, as it comes sooner to flower than sweet Marjoram, so it is used for the same Purposes, till the other comes to Maturity. There is a Variety of it with variegated Leaves. This is propagated by parting the Roots in Autumn, and should have a dry Soil, where it will thrive, requiring no other Culture than the 1st Sort.

The 3d Sort grows naturally in France and Italy; this hath a perennial Root, from which arise several slender, bending Stalks near a Foot high, garnished with oval, smooth Leaves standing on pretty long Foot Stalks. The Flowers are produced in oblong Spikes, which grow in clustered Panicles; they are small, of a purplish Colour, peeping out of their scaly Coverings. It flowers in June, and may be propagated by parting the Roots.

The 4th Sort grows plentifully about Orleans; this hath a perennial Root, from which arise several four-cornered Stalks about 6 Inches high, which frequently bend to the Ground, and put out Roots; they are garnished with oblong, hairy Leaves sitting close to the Stalk. The Flowers grow in oblong, clustered Spikes at the Top of the Stalks, having long coloured Bractæ between each; the Flowers are some whitish, others purple in the same Spikes; they are small, and peep out of their scaly Covers. This flowers in June, and may be propagated in the same Way as the former.

The 5th Sort grows naturally in the Levant; it is perennial. The Stalks rise near 2 Feet high, and branch out their whole Length; the Stalks are purple, and garnished with oval, rough Leaves, somewhat like those

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of Self-heal, but smaller. The Flowers grow in roundish, clustered Spikes, having short Bractææ, the Flowers are purple, and appear in *June*, but are not succeeded by Seeds here. It is propagated by parting the Heads, and must have a dry Soil.

The 6th Sort is the Origany of *Crete*, which is directed to be used in Medicine, but there has been great Confusion among Botanists in distinguishing the Species. This rises with four-cornered Stalks a Foot and Half high, garnished with oval hoary Leaves of a strong aromatick Scent. The Flowers grow in long, erect, bunched Spikes at the Top of the Stalks, having membranous Bractææ between, twice the Length of the Empalement; the Flowers are small and white like those of the common Origany. It flowers in *July*, but seldom perfects Seeds in *England*. It is propagated by parting the Roots, but must have a dry Soil and a warm Situation, otherwise it will not live through the Winter here.

The 7th Sort is the common sweet Marjoram, which is so well known as to need no Description. With us in *England* it is esteemed an annual Plant, though the Roots often live through the Winter in mild Seasons, or if they are sheltered in a Green-house; but in warm Countries, I believe, it is only biennial.

This is propagated by Seeds, which are generally imported from the South of *France* or *Italy*, for they seldom ripen in *England*. These are sown on a warm Border toward the End of *March*, and when the Plants are about an Inch high, they should be transplanted into Beds of rich Earth, at 6 Inches Distance every Way, observing to water them duly till they have taken new Root, after which they will require no other Care, but to keep them clean from Weeds. The Plants will spread and cover the Ground, in *July* they will begin to flower, at which Time it is cut for Use, and is then called knotted Marjoram, from the Heads of Flowers being collected into roundish close Heads like Knots.

The 8th Sort grows naturally in *Africa*; this is a perennial Plant with a low shrubby Stalk, rising about 18 Inches high, dividing into Branches, garnished with roundish, thick, woolly Leaves, and hollowed like a Ladle; they are like those of the common Marjoram, but of a thicker Substance and woolly, and have much the same Scent. The Flowers are produced in roundish Spikes closely joined together at the Top of the Stalks, and, at the End of the small Side Branches, they are of a pale Flesh Colour, peeping out of their scaly Coverings. This flowers in *July* and *August*, but does not ripen Seeds in *England*.

It is propagated by Slips or Cuttings, which if planted in a Border of good Earth during any of the Summer Months, and shaded from the Sun, and duly watered, will take Root freely; afterward the Plants may be taken up, and planted in small Pots filled with light Kitchen Garden Earth, and placed in the Shade till they have taken new Root, then they may be removed into an open Situation, where they may remain till the End of *October*, when they must be placed under Shelter, for they will not live through the Winter in the open Air here; but if they are put under a hot Bed Frame, to protect them from hard Frost, and have as

much free Air as possible in mild Weather, they will thrive better than if they are more tenderly treated.

The 10th Sort is the Dittany of *Crete*, which is used in Medicine; this grows naturally upon Mount *Ida*, in *Candia*; it is a perennial Plant. The Stalks are hairy, and rise about 9 Inches high, of a purplish Colour, and send out small Branches from their Sides by Pairs opposite; they are garnished with round, thick, woolly Leaves, which are very white; the whole Plant has a piercing aromatick Scent, and biting Taste; the Flowers are collected in small loose leafy Heads of a purple Colour, and nod downward. The Stamina stand out beyond the Petal, two of them being much longer than the other. It flowers in *June* and *July*, and in warm Seasons the Seeds ripen in Autumn.

This is propagated easily by planting Cuttings or Slips, during any of the Summer Months, either in Pots or a shady Border, covering them close with a Bell or Hand Glass to exclude the Air, and now and then refreshing them with Water, but they must not have too much Wet. When these have taken Root, they should be carefully taken up, and each planted in a small Pot, filled with light Earth, and placed in the Shade till they have taken new Root, when they should be removed into an open Situation, where they may continue till Autumn, and then placed under a hot Bed Frame, to screen them from the Frost, but they should enjoy the free Air at all Times in mild Weather. The following Spring some of the Plants may be shaken out of the Pots, and planted in a warm Border near a good aspected Wall, and in a dry Soil, where they will live through the common Winters without any other Shelter; but as they are liable to be killed by severe Frost, so it will be proper to keep a few Plants in Pots, to be sheltered in Winter to preserve the Kind.

The 11th Sort grows naturally on Mount *Sipylus* near *Magnesia*, where it was discovered by Sir *George Wheeler*, who sent the Seeds to the *Oxford* Garden, where the Plants were raised; this hath a perennial Root, but an annual Stalk. The Root is composed of many slender ligneous Fibres, the Leaves are oval, smooth, and of a grayish Colour, the Stalks are slender, of a purplish Colour, four-cornered and smooth; they rise near 2 Feet high, sending out slender Branches on each Side opposite, terminated by slender, oblong Spikes of purplish Flowers, which peep out of their scaly Covers; the Flowers are small, but shaped like those of the 10th Sort, their Stamina are extended out of the Petal a considerable Length. The Leaves, on the lower Part of the Stalk, are almost as large as the common Origany, but those on the upper Part of the Stalk and Branches are very small, and sit close to the Stalk. It flowers in *June* and *July*, and in warm Seasons the Seeds ripen here in Autumn. It is propagated by Cuttings or Slips, and treated as the *Cretan* Dittany.

The 12th Sort is undoubtedly a Variety, which has been produced by the Farina of the *Cretan* Dittany intermixing with that of Mount *Sipylus*; for the Plants now in the *Chelsea* Garden, were accidentally produced from the Seeds of one Species, where both Sorts stood near each other, in the Garden of *John Browning*, Esq; of *Lincoln's-Inn*; the Seeds were dropped from the Plant into the Border between the two Sorts, so

that it is uncertain from which Species; but as the Stalks and Heads of Flowers bear a greater Resemblance to the Dittany of Mount *Sipylus*, we may suppose it arose from the Seeds of that, which had been impregnated by the Farina of the *Cretan* Dittany, which grew near it; for the under Leaves of this are round, of a thick Texture and woolly, so nearly resembling those of the *Cretan* Dittany, as not to be distinguished from it; but the Stalks rise full as high as those of the Dittany of Mount *Sipylus*, but branch out more their whole Length, they are of a purple Colour and hairy. The lower Leaves on the Stalks are much larger than those of Mount *Sipylus*, and are a little hairy, approaching to those of the *Cretan* Dittany, but are not so thick or woolly; the upper Leaves are smooth, and approach to those of the other Sort, but are larger, as are also the Spikes of Flowers, and the scaly Leaves which cover the Flowers are larger and of a deeper purple Colour.

I have also dried Samples of another Variety, which arose from Seeds in the *Leyden* Garden; the Seeds were sent from *Paris*, by the Title which *Tournefort* gave to that which he found in the *Levant*, which I have joined to the Variety before mentioned. The Leaves of this are as large as those of the Dittany of *Crete*, but are not so thick or woolly; the Stalks rise more like those of the Dittany of Mount *Sipylus*, but branch out wider at the Top; the Flowers grow in closer Clusters, and do not nod downward; they are small, and shaped like those of the former Sort, flowering at the same Time.

By the Title which *Dr. Linnæus* has given to the *Cretan* Dittany, it may be supposed he has not seen the true Sort, for his Title better suits the Variety to which I have applied it; for all the Leaves of the true Dittany are very thick and woolly, even those which are situated immediately below the Flowers, whereas the lower Leaves only are so in his Title.

The 13th Sort grows at *Syracuse*; this hath perennial ligneous Stalks, which rise a Foot and a Half high, dividing into many small Branches, garnished with small Heart-shaped woolly Leaves, a little larger than those of *Marjoram*. The Flowers grow in oblong tufted Spikes which are hairy, they are small, white, and peep out of their scaly Covers; they appear in *July*, but seldom perfect Seeds in *England*. This is propagated by Cuttings or Slips, in the same Way as the 10th Sort, and the Plants require the same Treatment.

The 1st and 6th Sorts are used in Medicine, but the 1st being a Native of this Country, is frequently substituted for the other, which is rare in *England*, and is now seldom imported here. When the 1st Sort is used, those Plants which grow upon dry barren Ground are to be preferred, as they are much stronger and have greater Virtue, than those which grow on good Land, or are cultivated in Gardens.

The Dittany of *Crete* is also used in Medicine, but the dried Herb is generally imported into *England*, which, by being closely packed, and the Voyage long, loses much of its Virtue; so that if the Plants of *English* Growth were used, they would be found much better.

ORNITHOGALUM. *Tourn. Inst. Lin. Gen. Plant.*

377. [*Ornithogalum*, of *ὄρνις*, a Bird, and *γάλα*, Milk, i. e.

a Plant whose Flowers are as white as the white Plumes of feathered Animals.] Star of *Bethlehem*.

The Characters are,

The Flower has no Empalement. It is composed of six Petals, whose under Parts are erect, but spread open above, and are permanent. It hath six erect Stamens, about half the Length of the Petals, crowned by single Summits, with an angular Germen, supporting an Awl-shaped Style which is permanent, terminated by an obtuse Stigma. The Germen afterward turns to a roundish angular Capsule with three Cells, filled with roundish Seeds.

The Species are,

1. ORNITHOGALUM *racemo longissimo, filamentis lanceolatis, pedunculis floriferis patentibus aequalibus, fructiferis scapo approximatis. Lin. Sp. Plant. 307.* Star Flower with a very long Spike of Flowers, Spear-shaped Filaments, and Foot Stalks to the Flowers equal and spreading, and those of the Fruit approaching to the Stalk. This is the *Ornithogalum angustifolium majus, floribus ex albo virescentibus. C. B. P. 70.* Greater narrow-leaved Star Flower, with whitish green Flowers.

2. ORNITHOGALUM *racemo conico, floribus numerosis adscendentibus. Prod. Leyd. 32.* Star Flower with a conical Spike, having numerous Flowers rising above each other. This is the *Ornithogalum angustifolium, spicatum, maximum. C. B. P. 70.* Largest spiked Star Flower, with a narrow Leaf.

3. ORNITHOGALUM *racemo longissimo, foliis lanceolato-ensiformibus. Lin. Sp. Plant. 307.* Star Flower with the longest Spike, and Spear-shaped Leaves. This is the *Ornithogalum latifolium & maximum. C. B. P. 70.* Greatest broad-leaved Star Flower, called the Star Flower of *Alexandria*.

4. ORNITHOGALUM *racemo longissimo, pedunculis alternis brevioribus, petalis exterioribus angustioribus.* Star Flower with a very long Spike, the Foot Stalks of the Flowers alternately shorter, and the outer Petals narrow.

5. ORNITHOGALUM *floribus secundis pendulis, necario flamineo campaniformi. Lin. Sp. Plant. 308.* Star Flower with fruitful hanging Flowers, and a Bell-shaped Nectarium. *Ornithogalum Neapolitanum. Clus.* Star Flower of *Naples*.

6. ORNITHOGALUM *petalis alternis patentibus, interioribus erectis. Lin. Sp. Plant. 308.* Star Flower with spreading alternate Petals, and the lower ones erect. This is the *Ornithogalum luteo-virens Indicum. Corn. Canad.* Indian Star Flower of a yellowish green Colour.

7. ORNITHOGALUM *scapo anguloso diphylo, pedunculis umbellatis simplicibus. Flor. Succ. 270.* Star Flower with an angular Stalk having two Leaves, and single umbellated Foot Stalks. This is the *Ornithogalum luteum. C. B. P. 71.* Yellow Star Flower.

8. ORNITHOGALUM *scapo angulato diphylo, pedunculis umbellatis racemosis. Flor. Succ. 271.* Star Flower with an angular Stalk bearing two Leaves, and branching Foot Stalks having Umbels. This is the *Ornithogalum luteum minus. C. B. P. 71.* Smaller yellow Star Flower.

9. ORNITHOGALUM *floribus corymbosis, pedunculis scapo altioribus, filamentis emarginatis. Hort. Cliff. 124.* Star Flower with Flowers growing in a Corymbus, whose Foot Stalks are taller than the Stalk, and indented Filaments. This is the *Ornithogalum umbellatum medium*

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medium angustifolium. C. B. P. 70. Middle umbel-
lated Star Flower having narrow Leaves.

10. ORNITHOGALUM *floribus corymbosis, pedunculis
scapo humilioribus, filamentis emarginatis*. Prod. Leyd. 32.
Star Flower with Flowers in a Corymbus, Foot Stalks
lower than the Stalk, and indented Filaments. Orni-
thogalum Arabicum. Clus. Star Flower of Arabia.

11. ORNITHOGALUM *racemo conico laxo, pedunculis
longissimis, floribus erectis*. Plat. 192. Star Flower with a
loose conical Spike of Flowers, very long Foot Stalks,
and Flowers standing erect.

12. ORNITHOGALUM *foliis cordatis ovatis*. Prod.
Leyd. 31. Star Flower with oval, Heart-shaped Leaves.
This is the Ornithogalum Africanum, plantaginis roseæ
folio, radice tuberosa. Hort. Amst. 2. African Star
Flower with a Rose Plantain Leaf, and a tuberous Root.

13. ORNITHOGALUM *racemo longissimo, foliis tereti-
bus fistulosis*. Star Flower with a very long Spike, and
taper fistular Leaves. Ornithogalum Africanum, luteum
odoratum, foliis capaceis, radice tuberosa. H. L. African
Star Flower having yellow sweet Flowers, Leaves re-
sembling the Onion, and a tuberous Root.

The 1st Sort grows naturally near Bristol, also near
Cchester in Suffex, and other Parts of England. This
hath a pretty large bulbous Root, from which come
out several long keeled Leaves, which spread on the
Ground; between these comes out a single naked Stalk
about 2 Feet long, sustaining a long loose Spike of
Flowers of a yellowish green Colour, standing upon
pretty long Foot Stalks, which spread wide from the
principle Stalk; the Petals of the Flowers are narrow,
making but little Appearance. The Flowers have an
agreeable Scent, they appear in May, and when the
Seed Vessels are formed, the Foot Stalks which sustain
them become erect, and approach near the Stalk. The
Seeds ripen in August.

The 2d Sort grows naturally on the Hills in Portu-
gal and Spain, but has been long cultivated in the En-
glish Gardens, by the Title of Star of Bethlehem. This
hath a very large, oval, bulbous Root, from which a-
rise several long keeled Leaves of a dark green Colour,
and in the Middle comes out a naked Stalk which rises
near 3 Feet high, terminated by a long conical Spike
of white Flowers, standing on long Foot Stalks, one
above another. These appear in June, and are suc-
ceeded by roundish Seed Vessels, having 3 Cells filled
with roundish Seeds which ripen in August.

The 3d Sort grows naturally in Arabia; this hath a
very large bulbous Root, from which come out several
broad sword-shaped Leaves, which spread on the
Ground; the Stalk is thick and strong, rising between
2 and 3 Feet high, bearing a long Spike of large white
Flowers, standing on long Foot Stalks. They are com-
posed of 6 Petals which spread open in Form of a Star,
and appear in June, but do not ripen Seeds in England.

The 4th Sort grows naturally in the Levant. This
was brought me from the Island of Zant, by Mr. Moore,
who was Consul there; it hath a large bulbous Root,
from which arise 5 or 6 long narrow Leaves; the Stalk
rises 18 Inches high, and is terminated by a long loose
Spike of white Flowers, composed of 6 Petals, the in-
ner ones are broad, and the outer which stand alternate,

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are narrow. It flowers in June, but does not perfect
Seeds here.

The 5th Sort grows naturally in the Kingdom of
Naples, and is now become common in England, for
the Roots propagate so fast by Offsets and Seeds, as to
become troublesome Weeds in Gardens, and in many
Places where the Roots have been thrown out of Gar-
dens, they have grown on Dunghills, and in waste Places
as plentifully as Weeds. This hath a large compressed
bulbous Root, from which come out many long narrow
keeled Leaves, of a dark green Colour. The Stalks
are very thick and succulent, rising about a Foot high,
sustaining 10 or 12 Flowers in a loose Spike, each hang-
ing on a Foot Stalk an Inch long; they are composed
of 6 Petals, which are white within, but of a grayish
green on their Outside, having no Scent; within the
Petals is situated the Bell shaped Nectarium, composed
of 6 Leaves, out of which arise the 6 Stamina, termi-
nated by yellow Summits. The Flowers appear in
April, and are succeeded by large, roundish, three-cor-
nered Capsules, filled with roundish Seeds; as the Cap-
sules grow large, they are so heavy, as to weigh the
Stalk to the Ground.

The 6th Sort grows naturally in Africa, also in the
Island of Zant; this hath a bulbous Root, much smal-
ler than either of the former; the Leaves are long,
narrow, Keel shaped, and flaccid; the Stalks rise about
a Foot high; they are slender, and sustain 6 or 7 Flowers
hanging on long slender Foot Stalks, placed at a Dis-
tance from each other; these are composed of 6 Petals,
of a yellowish green Colour, the 3 inner standing erect,
and the 3 outer spread open wide. It flowers in July,
but does not produce Seeds here.

The 7th Sort grows naturally in Yorkshire, and some
other northern Counties in England; this hath a large
bulbous Root, from which come out 4 or 5 Keel-shap-
ed Leaves about 6 Inches long, and in the Middle arises
an angular Stalk having 2 narrow Leaves, which grow
about 6 Inches high, sustaining at the Top 6 or 8 yel-
low Flowers in Form of an Umbel, standing on slender
long Foot Stalks. These appear in April, and are suc-
ceeded by triangular Capsules having 3 Cells, filled with
roundish Seeds.

The 8th Sort hath small bulbous Roots not larger
than Peas, from which arise one or two narrow Keel-
shaped Leaves about 5 Inches long, of a grayish Co-
lour; the Stalk is angular, and rises about 4 Inches
high, having 2 narrow keeled Leaves just below the
Flowers, which are disposed in an Umbel upon branch-
ing Foot Stalks; these are yellow within, but of a pur-
plish green on the Outside; they appear in May, and
are succeeded by small triangular Capsules, filled with
reddish uneven Seeds. It grows on the Borders of cul-
tivated Fields, in France and Germany.

The 9th Sort grows naturally in most Parts of Eu-
rope, and is supposed to do so in England, though it is
seldom found here, unless in Orchards or Grounds,
where the Roots may have been planted, or thrown out
of Gardens with Rubbish. This hath a Bulb as large
as a small Onion, to which adhere many small Offsets;
the Leaves are long, narrow and Keel-shaped, spread-
ing on the Ground, and have a longitudinal white Line
through the Hollow. The Stalk rises about six Inches
high,

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high, sustaining an Umbel of Flowers which are white within, but have broad green Stripes on the Outside of the Petals; these stand on long Foot Stalks, which rise above the principal Stalk. It flowers in *April* and *May*, and is succeeded by roundish three cornered Capsules, filled with angular Seeds, which ripen in *July*.

The 10th Sort grows naturally in *Arabia*; it hath a large bulbous Root, sending up many long Keel-shaped Leaves, which embrace each other with their Base; they are of a deep green, and stand erect. The Flowers of this Kind I have never yet seen, though I have tried many ways to procure them: The Roots multiply exceedingly, and are never injured by Frost, although the Leaves are put out before Winter. These Roots are frequently brought over from *Italy* for Sale, but I have not heard of any having flowered; and *Clusius* says, he never saw but one Root flower, and that came from *Constantinople*.

The 11th Sort grows naturally at the *Cape of Good Hope*; this hath a round bulbous Root, covered with a white Skin, from which come out 4 or 5 keeled Leaves, embracing each other at their Base; they are of a deep green, 8 or 9 Inches long; in the Middle of these arises the Stalk, which is naked and about a Foot long; just under the Flowers, come out 2 or 3 short Leaves, which end in acute Points. The Flowers stand upon very long Foot Stalks, they are formed in a conical Spike, and are composed of 6 oval Petals of a pure white; within these are situated 6 Stamina, about half the Length of the Petals, terminated by roundish Summits. The Flowers are in Beauty in *May*, and are succeeded by roundish 3 cornered Capsules with 3 Cells, filled with roundish Seeds, which some Years ripen here in *July*.

The 12th Sort grows naturally at the *Cape of Good Hope*; this hath an irregular tuberous Root, varying greatly in Form and Size, covered with a dark brown Bark, from which arise several oval, Heart-shaped Leaves, upon pretty long Foot Stalks; they have several longitudinal Veins, like Ribwort Plantain. The Flower Stalks are slender, naked, and rise about a Foot high, sustaining several small, greenish, white Flowers, formed in a loose Spike, standing on long slender Foot Stalks. They come out in *November*, make but little Appearance, and are not succeeded by Seeds in *England*.

The 13th Sort grows naturally on the dry Rocks, at the *Cape of Good Hope*; this hath a large, depressed, bulbous Root, as big as a Man's Fist, covered with an uneven brown Skin, putting out several taper hollow Leaves, 9 or 10 Inches long, between which comes forth a naked Stalk near a Foot high, terminated by a loose Spike of yellow Flowers, of an agreeable sweet Scent. It flowers in *May*, but does not produce Seeds in *England*.

The 4 Sorts first mentioned, are cultivated for Ornament in the *English* Gardens. These are propagated by Offsets, which their Roots produce in great Plenty. The best Time to transplant them is in *July* or *August*, when their Leaves are decayed; for if they are removed late in Autumn, their Fibres will be shot out, when they will be very apt to suffer, if disturbed. They should have a light sandy Soil, not over dunged. They may be intermixed with other bulbous roots in the Borders of the Pleasure Garden, where they will afford an

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agreeable Variety, and continue in flower a long Time. Their Roots need not be transplanted oftener than every other Year, for if they are taken up every Year, they will not encrease so fast; but when they are suffered to remain too long unremoved, they will have so many Offsets about them as to weaken their blowing Roots. These may also be propagated from Seeds, which should be sown and managed as most other bulbous rooted Flowers, and will produce their Flowers in three or four Years after sowing.

The 5th Sort is scarce worthy of a Place in Gardens, but as it will thrive in any Situation or under Trees, so a few Plants may be admitted for the Sake of Variety.

The 6th Sort has not much Beauty, therefore a few Roots of it will be enough for Variety, as also of the 7th and 8th Sorts; the two last will thrive in Shade, but the 6th should have an open Situation.

The 9th and 10th Sorts multiply so fast by Offsets from the Roots, as to become troublesome Weeds in a Garden; for every small Root will grow, and in two Years produce 20 or 30 more, so that unless the large Roots are taken up every Year, and divested of their Offsets, the Borders will be over-run with them.

The 11th Sort is too tender to thrive in the open Air in *England*, so the Roots should be planted in Pots filled with light Earth, and in Autumn placed under a hot Bed Frame, where they may be screened from Frost, and in mild Weather enjoy the free Air. The Leaves of this appear in Autumn, and continue growing all the Winter, so must not be exposed to Frost; nor should they be drawn up weak, for then the Flowers will be few on a Stalk, and not large. If the Pots now and then receive a gentle Shower of Rain in Winter, it will be sufficient during that Season. Toward the Beginning of *July* the Leaves and Stalks decay, and then the Roots may be taken up, laying them in a dry cool Place till the End of *August*, when they must be planted again.

The 12th and 13th Sorts, were formerly more common in the *English* Gardens than at present. These Kinds are more tender than either of the former, so should be planted in Pots filled with fresh light Earth; and in Winter placed in an airy Glass Case, amongst Sedums, Ficoidefes, and such other pretty hardy succulent Plants, as require a large Share of Air in mild Weather, and but little Wet. In Summer they may be removed out of the House, and placed in a warm sheltered Situation, observing never to give them much Water when they are not in a growing State, lest it rot their Roots; but when they are growing freely, they must be frequently but gently refreshed with Water. These Roots should be transplanted every Year; the best Time for this Work is soon after the Flower Stems are decayed, when the Roots will be in the most inactive State. The Offsets should be carefully taken off, and each transplanted into a separate small Pot, filled with light fresh Earth, and may be treated as the old Roots.

The other Species which were included in this Genus, are now removed to *Scilla*.

ORNITHOPUS. *Lin. Gen. Pl.* 790. *Ornithopodium. Tourn. Inst.* Birds-foot; in *French, Piedd'oiseau.*

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Leaf, tubulour; and indented in 5 equal Segments at the Brim. The Flower is of the Butterfly Kind, the Standard is Heart-shaped and entire, the Wings are oval, erect, and almost as large as the Standard, the Keel is small and compressed. It hath 10 Stamina, 9 of which are joined, and one stands separate, terminated by single Summits. The Germen is narrow, supporting a briefly ascending Style, terminated by a punctured Stigma. The Germen becomes a taper incurved Pod, having many Joints connected together, but when ripe separate, each containing one oblong Seed.

The Species are,

1. *ORNITHOPUS foliis pinnatis, leguminibus compressis subarcuatis*. Birds-foot with winged Leaves, and compressed Pods a little arched. This is the *Ornithopodium majus*. C. B. P. 350. Greater Birds-foot.

2. *ORNITHOPUS foliis pinnatis, leguminibus confertis pedunculatis*. Birds-foot with winged Leaves, and Pods growing in Clusters upon Foot Stalks. This is the *Ornithopodium radice tuberculis nodosa*. C. B. P. 350. Birds-foot with knobbed, tubercular Roots.

3. *ORNITHOPUS foliis pinnatis, pinnis linearibus, leguminibus binis compressis arcuatis*. Birds-foot with linear, winged Leaves, and compressed arched Pods growing in Pairs. This is the *Ornithopodium Scorpiodes, siliqua compressa*. Tourn. Inst. 400. Birds-foot with the Appearance of Caterpillar, and flat Pods.

4. *ORNITHOPUS foliis pinnatis, leguminibus compressis villosis recurvis*. Birds-foot with winged Leaves, and compressed woolly Pods which are recurved. This is the *Ornithopodium minus Africanum incanum*. Till. Hort. Piff. Smaller African hoary Birds-foot.

5. *ORNITHOPUS foliis ternatis subsessilibus appendiculatis, impari maximo*. Hort. Cliff. 364. Birds-foot with trifoliate Leaves fitting close to the Stalk and having Appendages, and the middle Lobe very large. This is the *Ornithopodium Portulacæ folio*. Tourn. Inst. 400. Birds-foot with a Purslane Leaf.

The 1st Sort grows naturally in the South of France, in Spain and Italy. It is an annual Plant, having many trailing Stalks 18 Inches long, from which come out a few Side Branches, garnished with long winged Leaves, composed of about 18 Pair of small, oval Lobes, terminated by an odd one; these Lobes stand sometimes opposite, and at others they are alternate, and hairy. The Flowers are produced in small Clusters at the Top of Foot Stalks, which arise from the Wings of the Stalks, and are near 3 Inches long, having a small winged Leaf, Part of which is below, and the other Part above the Flowers, so that they seem to come from the Mid rib of the Leaf; the Flowers are of a deep Gold Colour, and shaped like a Butterfly. These appear in July, and are succeeded by flat, narrow Pods about 3 Inches long, which turn inward at the Top like a Bird's Claw. These are jointed, and a little hairy, containing a single Seed in each Joint, which ripens in Autumn, when the Joints separate and fall asunder.

The 2d Sort grows naturally on dry Commons and Heaths in England. The Root is composed of 2 or 3 strong Fibres, to which hang several small Tubercles or Knobs like Grains. There are many slender Stalks come out from the Root, which spread on the Ground, and are from 4 to 8 Inches long; these are garnished with small, winged, hairy Leaves, composed of 6 or 7 Pair

of narrow Lobes, terminated by an odd one. The Flowers stand on slender Foot Stalks, which come out at every Joint of the Stalk; they are small, of a yellow Colour, and are succeeded by Clusters of short Pods, which are a little incurved at the Top. It flowers and seeds about the same Time as the former.

The 3d Sort grows plentifully about Messina and Naples. The Root of this runs deep into the Ground, sending out a few small Fibres on the Side; the Stalks are about 6 Inches long, and do not lie flat on the Ground like the other; the leaves are hairy, and are composed of 10 or 12 Pair of narrow Lobes placed along the Mid-rib, terminated by an odd one. The Flowers grow in small Bunches on the Top of the Branches; they are yellow, and these are generally succeeded by 2 flat Pods an Inch long, turned inward like a Bird's Claw. This flowers in July and ripens Seeds in Autumn.

The 4th Sort was sent me from the Pisa Garden by Dr. Tili Professor of Botany, who informed me he had received the Seeds from Africa. This approaches near to the 1st Sort, but the Stalks are much longer and smooth; the Leaves are not so long; the Lobes are larger, and not more than the Number to each Leaf; the Pods are longer and broader, and but little arched at the Point. This is annual, and flowers in July.

The 5th Sort grows naturally among the Corn in Spain and Italy; this hath many smooth, branching Stalks, which rise near 2 Feet high, garnished toward their Top with trifoliate, oval Leaves sitting close, having 2 small Appendages. The lower Leaves are often single, and of a grayish Colour, the middle Lobe being twice the Size of the 2 side ones. The Flowers stand on slender Foot Stalks, are yellow, and succeeded by taper Pods 2 Inches long, shaped like a Bird's Claw. This flowers and seeds about the same Time with the former.

These Plants are propagated by sowing their Seeds in Spring upon a Bed of light fresh Earth, where they are to remain (for they seldom do well when they are transplanted; when the Plants come up, they must be carefully cleared from Weeds; and where they are too close, some of them should be pulled out, so as to leave the remaining ones about 10 Inches asunder. In June and July these Plants will flower, and the Seeds ripen in August. There is no great Beauty in them, but, for the Variety of their jointed Pods, they are preserved by some curious Persons in their Pleasure Gardens; where, if their Seeds are sown in Patches in the Borders, each Sort distinctly by itself, and the Plants thinned, leaving only 2 at each Patch, they will require no Care, and will add to the Variety, especially where the Snail and Caterpillar Plants are preserved, which are very proper to intermix with them. They are all annuals and perish soon after the Seeds are ripe.

OROBUS. Tourn. Lin. Gen. Pl. 780. [*Orbus* of *iswro*, to eat, and *Bis*, an Ox, q. d. an Herb with which Oxen are fed, because the Antients used to fatten their Oxen with a like Herb]. Bitter Vetch; in French, *Orbe*.

The Characters are,

The Empalement is tubulour, of one Leaf with an obtuse Base; the Brim is oblique and indented in 5 Parts, the 3 lower acute, the 2 upper shorter and obtuse. The Flower is of the Butterfly Kind; the Standard is Heart-shaped; the

the two Wings are almost as long as the Standard, and join together; the Keel is bifid, acute-pointed, and rising upwards; the Borders are compressed, and the Body swollen. It hath 10 Stamina, 9 are jointed and one separate, these are rising and terminated by roundish Summits. It hath a cylindrical compressed Germen, supporting a crooked rising Style, crowned by a narrow, downy Stigma, fastened by the inner Edge in the Middle to the Point of the Style. The Germen becomes a long taper Pod ending in an acute Point, having one Cell containing several roundish Seeds.

The Species are,

1. *OROBUS foliis pinnatis ovatis, stipulis semisagittatis integerrimis, caule simplici.* Lin. Sp. Pl. Bitter Vetch with oval winged Leaves, entire Stipulæ half Arrow-pointed, and a single Stalk. *Orobis sylvaticus purpureus vernus.* C. B. P. Purple, vernal, woody Bitter Vetch.

2. *OROBUS foliis pinnatis lanceolatis, stipulis semisagittatis, caule simplici.* Lin. Sp. Plant. 728. Bitter Vetch with Spear-shaped, winged Leaves, entire half Arrow-pointed Stipulæ, and a single Stalk. This is the *Orobis sylvaticus foliis oblongis glabris.* Tourn. Inst. R. H. 393. Wood Bitter Vetch with oblong smooth Leaves.

3. *OROBUS foliis pinnatis oblongo-ovatis obtusis, stipulis semisagittatis integerrimis, caule hirsuto.* Bitter Vetch with oblong, oval, obtuse, winged Leaves, entire Stipulæ half Arrow-pointed, and a hairy Stalk. *Orobis sylvaticus nostras.* Raii. Syn. English Wood Bitter Vetch.

4. *OROBUS caule ramoso, foliis sexjugis ovato-oblongis.* Hort. Cliff. 366. Bitter Vetch with a branching Stalk, and Leaves composed of six Pair of oblong oval Lobes. This is the *Orobis sylvaticus foliis vicia.* C. B. P. 352. Wood Bitter Vetch with a Vetch Leaf.

5. *OROBUS foliis pinnatis lineari-lanceolatis decurrentibus, stipulis semisagittatis, caule simplici.* Bitter Vetch with linear, Spear-shaped, winged Leaves, running along the Stalk, half Arrow-shaped Stipulæ, and a single Stalk. This is the *Orobis angustifolius Italicus, flore vario.* Tourn. Inst. R. H. 393. Narrow-leaved Italian Bitter Vetch with a variable Flower.

6. *OROBUS caule ramoso, foliis quadrijugatis lanceolatis nervosis.* Bitter Vetch with a branching Stalk, and Leaves composed of four Pair of nervous, Spear-shaped Lobes. *Orobis Pyrenaicus, foliis nervosis.* Tourn. 393. Bitter Vetch of the Pyrenees with nervous Leaves.

7. *OROBUS foliis conjugatis subsessilibus, stipulis dentatis.* Hort. Upsal. 220. Bitter Vetch with Leaves placed by Couples close to the Stalks, and indented Stipulæ. This is the *Lathyroides erecta, folio ovato acuminato, caeruleis vicia floribus & siliquis, Siberica.* Amman. Ruth. 151. Siberian upright Bastard Lathyrus, with an oval, acute-pointed Leaf, blue Flowers and Pods like the Vetch.

8. *OROBUS foliis pinnatis ovato-oblongis, stipulis rotundato-lunatis dentatis, caule simplici.* Lin. Bitter Vetch with oval, oblong, winged Leaves, roundish, Moon-shaped, indented Stipulæ, and a single Stalk. *Orobis Sibericus perenne.* Gemel. Perennial Siberian Bitter Vetch.

9. *OROBUS foliis pinnatis ovatis acutis, quatuor-jugatis, caule simplici.* Tab. 193. fol. 2. Bitter Vetch with oval, acute-pointed, winged Leaves, having four Pair of Lobes and a single Stalk. This is the *Orobis Veneticus.* Clus. Hist. 232. Venetian Bitter Vetch.

10. *OROBUS foliis pinnatis, foliolis ovatis, caule arborescente.* Bitter Vetch with winged Leaves, having oval

Lobes, and a Tree like Stalk. *Orobis arborescens, foliis ovatorum paribus pluribusque.* Gemel. Tree Bitter Vetch with many Pair of oval Leaves, called *Caragana*.

11. *OROBUS Americanus erectus, foliorum pinnis angustioribus & subtus incanis, siliquis glabris.* Houst. Mss. Upright American Bitter Vetch, with very narrow Lobes to the Leaves, hoary on their under Side, having smooth Pods:

12. *OROBUS Americanus, latifolius, argenteus, flore purpureo.* Houst. Mss. Broad-leaved silvery American Bitter Vetch with a purple Flower.

13. *OROBUS Americanus procumbens & hirsutus, flore purpureo.* Houst. Mss. Trailing hairy American Bitter Vetch with a purple Flower.

14. *OROBUS Americanus procumbens minimus, flore coccineo.* Houst. Mss. The least trailing American Bitter Vetch, having a scarlet Flower.

The 1st Sort grows naturally in the Forests of Germany and Switzerland. The Root of this is perennial, composed of many strong Fibres; the Stalks rise a Foot high, and are garnished with winged Leaves, composed of 2 Pair of oval, acute-pointed Lobes, and at the Base of the Foot Stalk is situated a Stipula, (or small Leaf), shaped like the Point of an Arrow cut through the Middle. This embraces the Stalk. The Lobes of the Leaves are about an Inch and a Half long, and near an Inch broad, ending in acute Points. The Flowers stand on Foot Stalks, which arise from the Wings of the Stalk; they are about 3 Inches long, sustaining 6 or 7 Flowers ranged in a Spike, which are of the Butterfly Kind. These are at first of a purple Colour, but afterward change blue; they appear early in Spring, and are succeeded by slender taper Pods an Inch and a Half long, having one Cell, in which are lodged 4 or 5 oblong bitter Seeds, which ripen in June. There is a Variety with pale Flowers preserved in some Gardens.

The 2d Sort grows naturally in Woods and shady Places in most Parts of England. This hath a perennial creeping Root, from which arise angular Stalks, 9 or 10 Inches long, garnished at each Joint by one winged Leaf, composed of four Pair of smooth, Spear-shaped Lobes, and, at the Base of each, is situated a Stipula like that of the 1st Sort, and from the Wings of the Stalks arise the Foot Stalks of the Flowers, which are about 4 Inches long, each sustaining 2 or 3 purplish red Flowers, which turn to a deep purple before they fade. These appear in April, and are succeeded by long taper Pods, containing 6 or 7 roundish Seeds, which ripen the Beginning of June. These are called Wood or Heath Pease.

The 3d Sort grows naturally in Cumberland and Wales. The Root is perennial and ligneous, from which arise several hairy Stalks a Foot and a Half high, garnished at each Joint with one winged Leaf composed of 10 or 11 Pair of narrow Lobes ranged close together along the Mid-rib; at the Base of which is situated an acute Stipula embracing the Stalk. The Flowers are disposed in a close Spike standing on Foot Stalks 3 Inches long, which arise from the Wings of the Leaves; they are of a purple Colour, and succeeded by short flat Pods containing 2 or 3 Seeds. It flowers the Beginning of June; the Seeds ripen in July.

The 4th Sort grows naturally on the Mountains in Germany and Switzerland. This hath a strong, ligneous, perennial

perennial Root, from which arise many branching Stalks 2 Feet high, garnished at each Joint by one winged Leaf, composed of 5 or 6 small, oblong, oval Lobes ranged along the Mid-rib. The Flowers stand on very long Foot Stalks, which arise from the Wings of the Stalk; these sustain at their Top 4, 5 or 6 purple Flowers, which appear in *May*, and are succeeded by compressed Pods, an Inch and a Half long, containing 4 or 5 oblong Seeds, which ripen the Beginning of *July*. The Stalks decay in Autumn, and new ones arise in the Spring.

The 5th Sort grows naturally about *Bologna*, and in other Parts of *Italy*; this hath a perennial Root composed of many thick fleshy Tubers. The Stalks are comered, and rise 18 Inches high, garnished with winged Leaves composed of 4 Pair of linear, Spear-shaped Lobes placed along the Mid-rib, which is bordered by the Running of the Lobes from one to another; at the Base of each Leaf is situated a Stipula shaped like that of the 1st, and out of this arises the Foot Stalk of the Flower, which is 4 or 5 Inches long, sustaining 7 or 8 Flowers ranged in a loose Spike. They are variegated with purple, blue and red, appear in *May*, and are succeeded by Pods containing 2 or 3 Seeds, which ripen in *July*.

The 6th Sort grows naturally on the *Pyrenean Mountains*; this hath a perennial Root, from which arise several smooth branching Stalks a Foot and a Half high, garnished with winged Leaves composed of 4 Pair of Spear-shaped Lobes, which have 3 longitudinal Veins; at the Base of the Leaves is situated a Stipula embracing the Stalk as the first. The Flowers stand on long Foot Stalks, arising from the Wings of the Leaves; toward the upper Part of the Stalk, they are ranged in a loose Spike, are of a purple Colour, appearing in *May*, and are succeeded by compressed Pods about 2 Inches long, containing 3 or 4 Seeds, which ripen in *July*.

The 7th Sort grows naturally in *Siberia*; this hath a perennial Root, from which arise 3 or 4 branching Stalks about a Foot high. The Leaves stand by Pairs opposite along the Stalks, to which they sit close, having an indented Stipula at their Base; they are smooth, stiff, and of a lucid green. The Flowers grow in close Spikes upon short Foot Stalks, which rise from the Wings of the Leaves at the Top of the Stalks, where are generally 3 or 4 Spikes standing together. The Flowers are of a fine blue Colour, they appear in *June*, and are succeeded by short flatish Pods, containing 2 or 3 Seeds in each, which ripen in *August*.

The 8th Sort grows naturally in *Siberia*; this hath a perennial Root, from which arise several herbaceous Stalks a Foot and a Half high, garnished with winged Leaves composed of 4 or 5 Pair of oval, oblong Lobes, having at their Base a roundish Moon-shaped Stipula embracing the Stalk. The Flowers come out from the Wings of the Leaves on short Foot Stalks; they are large and of a purple Colour, appearing in *April*, and are succeeded by swelling Pods near 2 Inches long, containing 4 or 5 Seeds, which ripen in *June*.

The 9th Sort grows naturally in *Italy*; this hath a perennial Root, from which arise 2 or 3 single Stalks about a Foot high, garnished with winged Leaves composed of 4 Pair of oval Lobes, ending in acute Points; they are smooth and of a pale green Colour, placed distant on the Mid-rib. The Flowers come out on slender Foot

Stalks, which arise from the Wings of the Leaves, 4 or 5 standing at the Top, they are purple and appear in *February*. These are succeeded by swelling Pods an Inch and a Half long, each containing 3 or 4 roundish Seeds, which ripen in *May*.

The 10th Sort grows naturally in *Siberia*; this rises with a Tree like Stalk 10 or 12 Feet high, dividing into several Branches, covered with a greenish Bark, and garnished with winged Leaves, composed of 6 or 8 Pair of oval, smooth Lobes ending in Points. The Flowers come out in slender loose Spikes from the Sides of the Branches; they are yellow, of the same Shape of the other Species, but hang downward. These appear in *May*, and are succeeded by swelling Pods, each containing 4 or 5 roundish Seeds, which ripen in *July*.

The 11th Sort grows naturally in *Jamaica*, from whence the Seeds were sent in 1731. This rises with a very branching Stalk about 3 Feet high, which is ligneous; the Branches are garnished with winged Leaves, composed of 5 or 6 Pair of narrow, Spear-shaped Lobes, woolly on their under Side. The Flowers grow in loose Spikes at the End of the Branches, of a pale purple Colour, and are succeeded by smooth compressed Pods an Inch and a Half long, each containing 5 or 6 roundish Seeds.

The 12th Sort was discovered by Dr. *Houfoun* at *La Vera Cruz*, from whence he sent the Seeds to *England*. This rises with a shrubby Stalk 5 or 6 Feet high, dividing into many slender Branches, covered with a brown woolly Bark, and garnished with soft, fatty, winged Leaves; those on the young Branches are composed of 4 Pair of oval, obtuse Lobes of a brownish green Colour, and hairy on their upper Side, but of a silvery, silky Hue on their under. The Leaves on the upper Branches are composed of 7 or 8 Pair of oblong, oval Lobes, of the same Colour and Consistence as the lower. The Flowers are produced in long erect Spikes, at the End of the Branches; they are of a deep purple Colour, and are succeeded by long, woolly, compressed Pods, each containing 4 or 5 Seeds.

The 13th Sort was also discovered at *La Vera Cruz*, and sent to *England* in 1730. This is a low Plant, whose Stalks bend to the Ground, and are seldom more than 6 or 8 Inches long, from which come out a few short Side Branches; they are garnished with winged Leaves, composed of 4 or 5 Pair of small, oblong, oval, woolly Lobes, terminated by an odd one, the upper Lobes being much larger than the lower. The Flowers come out in small bunches standing on short Foot Stalks, which arise from the Wings of the Stalk; they are small, and of a bright purple Colour; these are succeeded by compressed Pods near 2 Inches long, each having 6 or 7 roundish compressed Seeds.

The 14th Sort was discovered growing naturally in the same Country. This hath a pretty thick ligneous Root, which sends out many slender Stalks a Foot and a Half long, trailing upon the Ground, garnished with winged Leaves composed of 3 or 4 Pair of narrow hoary Lobes, about half an Inch long. The Flowers come out from the Side and at the End of the Stalks, 3 or 4 standing on a short Foot Stalk; they are small, of a scarlet Colour, and are succeeded by short taper Pods, each containing 3 or 4 small roundish Seeds.

The nine Sorts first mentioned, have perennial Roots but annual Stalks, which decay every Autumn; several of these may be propagated by parting their Roots; the best Time for doing this is in Autumn, that the Plants may be well established before the Spring; for as several of them begin to put out their Stalks very early in the Spring, so if they are then disturbed, it will either prevent their flowering, or cause their Flowers to be very weak. Most of these Plants delight in a shady Situation, and love a loamy Soil.

They are also propagated by Seeds, but these should be sown in Autumn, for if they are kept out of the Ground till Spring, some of the Sorts will never grow, and those which do, seldom vegetate the same Year; the 4th Sort I could never raise from Seeds sown in the Spring, though I have made the Trial in different Situations many Times; but the Seeds which have scattered in the Summer, have come up well the following Spring, as have also those which were sown in September. When the Plants come up, they must be kept clean from Weeds, and where too close together should be thinned, so as they may have Room to grow till Autumn, when they should be transplanted into the places where they are designed to remain. If the Roots are strong, they will flower very well the following Spring, but those which are weak will not flower till the 2d Year; therefore such may be planted in a shady Border at 4 or 5 Inches Distance, where they may grow one Year to get Strength, and then may be removed to the places where they are to remain. The farther Care of them is only to dig the Ground between them in Winter, and in Summer to keep them clean from Weeds.

The 1st, 4th, 5th, 7th, 8th, and 9th Sorts, are ornamental Plants; and as they are very hardy, requiring little Culture, and will thrive in the Shade, they deserve a Place in every good Garden.

The 10th Sort grows to be a tall Shrub, especially in a cool Situation and moist Soil; but if it is planted in a warm Situation, the Shoots come out with the first warm Weather in February, so are frequently killed by the Frost in March; The Plants are also difficult to transplant, especially if they are not removed young, for their Roots are composed of long tough Fibres, which extend to a considerable Distance all round; and when these are cut or broken, it often destroys the Plants, or so much weakens them, that they do not recover in less than two or three Years.

This Sort is propagated by Seeds, which should be sown on a shady Border in Autumn or Winter, when they will succeed better than if sown in Spring. They should not be sown very close, to allow Room for the Plants to grow till the following Autumn, before which Time it will be impossible to remove them. When the Plants come up, they must be kept clean from Weeds; and in Autumn, as soon as their Leaves decay, they may be transplanted to the Places where they are to remain; for when they are transplanted so young, I find they will more certainly grow, and will soon overtop any Plants, which are removed at a greater Age. This Shrub should be planted in a moist Soil and shady Situation, where it will thrive exceedingly, and produce Flowers and Seeds annually.

The 4 last mentioned Sorts being Natives of warm

Countries are tender, so must be preserved in Stoves, otherwise they will not live in England. These are propagated by Seeds, sown early in Spring, in small Pots filled with light rich Earth, and plunged into a hot Bed of Tanners Bark, observing frequently to moisten the Earth, otherwise the Seeds will not grow. When the Plants come up, they should be carefully taken out of the Pots, and each transplanted into separate small Pots filled with rich Earth, and then plunged again into the Tan Bed, observing to shade them until they have taken Root; after which Time they should have fresh Air admitted every Day in warm Weather, and must be frequently watered. With this Management the Plants will make a great Progress. When any of them are grown too tall to remain in the hot Bed, they should be taken out, and plunged into the Bark Bed in the Stove where they may have Room to grow, especially the 11th and 12th Sorts; but the other two being of humbler Growth, may be kept in the hot Bed until Michaelmas, when the Nights begin to be cold; at which Time they should be removed into the Stove, and plunged in the Bark Bed, where they must be treated as other tender exotics; by which Method they may be preserved through the Winter, and the following Summer they will produce Flowers. These Plants are perennial, so if they should not perfect their Seeds, the Plants may be maintained for several Years.

ORYZA. Tourn. Inst. Rice; in French, *Ris*.

The Characters are,

The Chaff is small, acute-pointed, having 2 Valves nearly equal, inclosing a single Flower. The Petal has 2 Valves hollow, compressed, and Boat-shaped, ending in a Beard or Awn. It has a two-leaved Nectarium, and 6 hairy Stamina the Length of the Petal, terminated by Summits whose Base are hispid, and a turbinate Germen, supporting 2 reflexed hairy Styles, crowned by feathered Stigmas. The Germen becomes one large, oblong, compressed Seed, having 2 Channels on each Side, sitting on the Petal of the Flower.

There is but one Species of this Plant, viz.

ORYZA. Matth. 403. Rice.

This Grain is cultivated in most of the eastern Countries, where it is the chief Support of the Inhabitants; great Quantities of it are brought into England and other European Countries every Year, where it is in great Esteem for Puddings, &c. it is too tender to be produced in these northern Countries, without the Assistance of artificial Heat; but from Seeds formerly sent to South Carolina, great Quantities have been produced, and it is found to succeed as well there as in its native Country, which is a great Improvement to our American Settlements.

This Plant grows on moist Soils, where the Ground can be flowed over with Water after it is come up; so whoever would cultivate it in England for Curiosity, should sow the Seeds on a hot Bed, and when the Plants are up, they should be transplanted into Pots filled with rich light Earth, and placed in Pans of Water, which should be plunged into a hot Bed; as the Water wastes, it must from Time to Time be renewed again. In July the Plants may be set abroad in a warm Situation, still preserving the Water in the Pans, otherwise they will not thrive; and toward the latter End of August, they will

will produce their Grain, which will ripen tolerably well, if the Autumn proves favourable.

OSIER. See *Salix*.

OSMUNDA, Osmund Royal, or flowering Fern.

This is one of the Kinds of Fern which is distinguished from the other Sorts, by its producing Flowers on the Top of the Leaves; whereas the others, for the most part, produce them on the Back of their Leaves.

There is but one Kind of this Plant, which grows wild in *England*, but there are several Sorts of them which grow in *America*; but as they are seldom kept in Gardens, I shall not enumerate their Species.

The common Sort grows on Bogs in several Parts of *England*, therefore whoever hath an Inclination to transplant it into Gardens, should place it in a moist shady Situation, otherwise it will not thrive.

OSTEOSPERMUM. *Lin. Gen. Plant.* 887. *Monilifera*. *Vaill. Ail. Par.* 1720. *Cbrysanthemoides*. *Tourn. Ail. Par.* 1705. Hard seeded Chrysanthemum.

The Characters are,

The Flower hath an hemispherical Empalement, which is single, and cut into many Segments. The Flower is composed of several hermaphrodite Flowers in the Disk, which are tubulous, and cut at the Brim into 5 Parts. These are surrounded by several female radiated Flowers, each having a long narrow Tongue, cut into 3 Parts at the Top. The hermaphrodite Flowers have each 5 slender short Stamina, terminated by cylindrical Summits, with a small Germen supporting a slender Style, crowned by an obsolete Stigma; these are barren. The female Flowers have each a globular Germen supporting a slender Style, crowned by an indented Stigma; the Germen becomes one single hard Seed.

The Species are,

1. *OSTEOSPERMUM foliis oppositis palmatis*. *Hort. Cliff.* 424. Hard-seeded Chrysanthemum, with palmated Leaves growing opposite. This is the *Cbrysanthemum angulosum platani foliis*, *Virginianum*. *Pluk. Phyt. Virginian* Corn Marygold, with angular Plane Tree Leaves.

2. *OSTEOSPERMUM foliis ovalibus obsolete serratis*. *Lin. Hort. Cliff.* 424. Hard-seeded Chrysanthemum, with oval Leaves, which are slightly sawed. This is the *Chrysanthemoides Afrum populi albae foliis*. *Hort. Elth.* 80. *Tab.* 68. Hard-seeded African Chrysanthemum, with Leaves like those of white Poplar.

3. *OSTEOSPERMUM foliis lanceolatis acutè dentatis, caule fruticoso*. *Tab.* 194. *Fig.* 1. Hard-seeded Chrysanthemum, with Spear-shaped Leaves which are acutely indented, and a shrubby Stalk.

4. *OSTEOSPERMUM spinis ramosis*. *Lin. Hort. Cliff.* 424. Hard-seeded Chrysanthemum, with branching Spines. This is the *Chrysanthemoides osteospermum Africanum odoratum, spinosum & viscosum*. *Hort. Amst.* 2. p. 85. Hard-seeded Chrysanthemum of *Africa*, which is prickly, viscous, and sweet.

5. *OSTEOSPERMUM foliis lanceolatis imbricatis sessilibus*. *Flor. Leyd. Prod.* 179. Hard-seeded Chrysanthemum with Spear-shaped Leaves sitting close to the Stalks, and lying over each other like the Scales of a Fish. This is the *Monilifera polygoni foliis*. *Vaill. Ail. Par.* 1720. *Monilifera* with Knot Grass Leaves.

The 1st Sort is a Native of *America*, growing in *Virginia* and *New England*, in low moist Ground. It dies to the Root every Autumn, and rises again the following

Spring; when growing on a moist rich Soil, the Shoots will rise 5 or 6 Feet high garnished with very large, angular, divided Leaves, placed by Pairs opposite, which are shaped somewhat like those of the Plane Tree. The Flowers are produced at the Extremity of the Shoots, which are shaped like those of the Sun Flower, but small, so do not make much Appearance. This Sort never produces any Seeds in *England*, so can only be propagated by parting the Roots, but this should not be done oftener than every 3d or 4th Year. The best Season for this, and for transplanting the Roots is in *October*, soon after the Shoots decay. These Roots should be planted in light rich Earth, and should have a moist Situation, where they will thrive extremely well; but in dry Ground, if they are not duly watered in dry Weather, they will make no Progress, and frequently decay in hot Weather. It will endure the Winter's Cold very well in the open Air.

If the Seeds of this Plant are procured from *America*, they should be sown on a Bed of rich Earth, and in dry Weather should be watered. These Seeds generally remain in the Ground a whole Year, before the Plants appear. When the Plants come up, they should be treated as hath been directed for the old Plants.

The 2d Sort grows naturally at the *Cape of Good Hope*, but has been several Years an Inhabitant of the *English* Gardens. This rises with a shrubby Stalk 7 or 8 Feet high, covered with a smooth gray Bark, and divides into several Branches, garnished with oval Leaves, which are unequally indented on their Edges; they are placed alternately, and are of a thick Consistence, covered with a hoary Down, which goes off from the older Leaves. The Flowers are produced in Clusters at the End of the Branches, 6 or 8 coming out together, upon Foot Stalks an Inch and a Half long; these are yellow, and shaped like those of Ragwort. The Border or Rays are composed of about 10 half Florets, which spread open; the Disk or Middle is composed of tubulous Florets, which are cut into 5 Parts at the Brim; these are barren, but the half Florets round the Border, have one hard Seed, succeeding each of them. This Plant flowers but seldom here; the time of its flowering is in *July* or *August*.

The 3d Sort grows like the 2d, but the Leaves are more pointed, of a green Colour, and acutely sawed on the Edges; the Foot Stalks of the Leaves are bordered, and the Leaves deeply veined. This produces Tufts of yellow Flowers at the Extremity of the Shoots from Spring to Autumn, and often ripens Seeds.

The 4th Sort is a low shrubby Plant, which seldom rises above 3 Feet high, and divides into many Branches; the Ends of the Shoots are beset with green branching Spines; the Leaves are very clammy, especially in warm Weather; these are long and narrow, and set on without any Order. The Flowers are produced singly at the Ends of the Shoots, which are yellow, and appear in *July* and *August*.

These 3 Sorts are too tender to live in the open Air in *England*, so are placed in the Green-house in *October*, and may be treated as Myrtles, and other hardy Green-house Plants, which require a large Share of Air in mild Weather; and in the Beginning of *May* the Plants may be removed into the open Air, and placed in a sheltered

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ed Situation during the Summer Season. The second and third Sorts must have Plenty of Water, being very thirsty Plants, but the fourth Sort must have it given but moderately, especially in Winter.

These Plants are propagated by Cuttings, which may be planted in any of the Summer Months, on a Bed of light Earth, and should be watered and shaded until they have taken Root, which will be in 5 or 6 Weeks, when they must be taken up, and planted in Pots; for if they are suffered to stand long, they will make strong vigorous Shoots, and will be difficult to transplant afterward, especially the 2d and 3d Sorts; but there is not so much Danger of the 4th, which is not so vigorous, nor so easy in taking Root as the other. During the Summer Season the Pots should be frequently removed, to prevent the Plants from rooting through the Holes in the Bottom of the Pots, into the Ground, which they are very apt to do when they continue long undisturbed, and then they shoot very luxuriantly; but on their being removed, these Shoots, and sometimes the whole Plant, will decay.

The 5th Sort grows naturally at the Cape of Good Hope; this hath a shrubby Stalk about 4 Feet high, which divides into many small Branches, garnished with small oblong Leaves which sit close to them, and in some of the upper Branches they lie over each other like the Scales of Fish. The Flowers come out at the End of the Branches, standing singly upon Foot Stalks about an Inch long; the half Florets which compose the Border or Rays, are acute-pointed and spread open, the Disk is composed of Florets which are barren. This Sort is propagated by Cuttings, as the other Sorts, and must be treated in the same Way.

OSYRIS. *Lin. Gen. Plant.* 978. *Casia. Tourn. Inst. R. H.* 664. *Tab.* 488. *Poets Casia.*

The Characters are,

It is male and female in different Plants; the Emplacement of the Flower is of one Leaf, which is divided into three acute Segments. The Flower hath no Petals, but those on the male Plants have three short Stamina; the female have a Germen, which afterward changes to a globular Berry, having a single Seed.

We have but one Species of this Plant, viz.

OSYRIS frutescens baccifera. C. B. P. Shrubby Berry-bearing Poets Casia; and by some, Red-berried shrubby Casia.

This is a low Shrub, seldom rising above 2 Feet high, having ligneous Branches, garnished with long narrow Leaves, of a bright Colour. The Flowers appear in June, and are of a yellowish Colour, succeeded by Berries, which at first are green, and afterward turn to a bright red, like those of Asparagus.

This Plant grows wild in the South of France, in Spain, and some Parts of Italy, by the Side of Roads, also between the Rocks, but is with great Difficulty transplanted into Gardens; nor does it thrive after being removed; so the only Method to obtain it is, to sow the Berries where they are to remain. These Berries commonly remain a Year in the Ground before the Plants appear, and sometimes they will lie 2 or 3 Years, so that the Ground should not be disturbed under 3 Years, if the Plants do not come up sooner. These Seeds must be procured from the Places where the Plants naturally grow, for those which have been brought into Gardens

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never produce any, and it is with great Difficulty they are preserved alive.

OTHONNA. *Lin. Gen. Plant.* 888. *Doria. Raii. Meth. Plant.* 33. *Jacobaea. Tourn. Inst.* Ragwort.

The Characters are,

It hath a radiated Flower composed of hermaphrodite Florets which form the Disk, and female half Florets which form the Rays or Border; these are included in one common single Emplacement of one Leaf, cut into 8 or 10 Segments. The hermaphrodite Flowers are tubulous, indented at the Top in 5 Parts; the female half Florets are stretched out like a Tongue, and the Point has 3 Indentures reflexed. The hermaphrodite Florets have short hairy Stamina, terminated by cylindrical Summits, and an oblong Germen supporting a slender Style, crowned by a single Stigma. The female half Florets have oblong Germen with a slender Style, crowned by a large bifid reflexed Stigma. The hermaphrodite Florets are seldom fruitful, but the female half Florets have an oblong Seed, which is sometimes naked, and at others crowned with Down; these sit in the permanent Emplacement.

The Species are,

1. OTHONNA foliis pinnatifidis tomentosis, laciniis sinuatis, caule fruticoso. *Hort. Upsal.* 273. Othonna with woolly Wing-pointed Leaves, sinuated Jags, and a shrubby Stalk. This is the *Jacobaea maritima*. C. B. P. 131. Sea Ragwort.

2. OTHONNA foliis oblongo-ovatis, pinnato-sinuatis, supernè viridi-nigricantibus, infernè tomentosis, caule fruticoso. Othonna with oblong, oval, Wing, sinuated Leaves of a dark green on their upper Side, woolly on their under, and a shrubby Stalk. This is the *Jacobaea maritima latifolia*. C. B. P. Broad leaved Sea Ragwort.

3. OTHONNA foliis reniformibus suborbiculatis denticulatis petiolatis. *Lin. Sp. Pl.* 924. Othonna with Kidney-shaped, orbicular, indented Leaves, having Foot Stalks. This is the *Jacobaea Africana bederae terrestris folio repens*. H. *Amst.* 2. p. 145. Creeping African Ragwort, with a Groundivy Leaf.

4. OTHONNA foliis infimis lanceolatis integerrimis, superioribus sinuato-dentatis. *Hort. Cliff.* 419. Othonna with Spear-shaped lower Leaves which are entire, and the upper ones indented in Sinuses. This is the *Jacobaea Africana frutescens coronopi folio*. *Hort. Amst.* 2. p. 139. Shrubby African Ragwort, with a Hartshorn Leaf.

5. OTHONNA foliis lanceolatis integerrimis. *Hort. Cliff.* 419. Othonna with Spear-shaped entire Leaves. This is the *Jacobaea Africana frutescens, crassius & succulentis foliis*. *Hort. Amst.* 2. p. 147. Shrubby African Ragwort, with thick succulent Leaves.

6. OTHONNA foliis cuneiformibus integerrimis sessilibus, caule fruticoso procumbente, pedunculis longissimis. Othonna with entire Wedge-shaped Leaves sitting close, a shrubby trailing Stalk, and very long Foot Stalks to the Flowers. This is the *Caliboides Africana, glasti folio*. *Juss.* African Bastard Marygold, with a Woad Leaf.

7. OTHONNA foliis pinnatifidis, laciniis linearibus parallelis. *Hort. Cliff.* 419. Othonna with Wing-pointed Leaves, whose Segments are narrow and parallel. *Jacobaea Africana frutescens, foliis absinthii umbelliferi incanis*. *Hort. Amst.* Shrubby African Ragwort, with hoary

hoary Leaves like those of the umbelliferous Worm-wood.

8. *OTHONNA foliis multifido-pinnatis linearibus. Flor. Leyd. Prod. 380.* *Othonna* with very narrow Leaves, ending in many winged Points. This is the *Jacobaea Africana frutescens, foliis abrotani s. crithmi major & minor. Volk. Norim. 225.* Shrubby African Ragwort, with a Southernwood or Samphire Leaf.

9. *OTHONNA foliis ovato-cuneiformibus dentatis. Lin. Sp. Plant. 926.* *Othonna* with oval, Wedge-shaped, indented Leaves. This is the *Solidago foliis oblongis dentatis glabris, floribus magnis umbellatis. Burm. Afr. 164. Tab. 59.* Woundwort with oblong, indented, smooth Leaves, and large Flowers growing in Umbels.

10. *OTHONNA foliis ovato-lanceolatis denticulatis subtus tomentosis, floribus corymbosis. Othonna* with oval, Spear-shaped, indented Leaves, which are woolly on their under Side, and Flowers growing in a Corymbus. This is the *Doria Americana, foliis serratis & subtus incanis. Houst. Mss. American Doria* with sawed Leaves, which are hoary on their under Side.

There are some other Species of this Genus, some of which grow naturally in England, and being troublesome Weeds, are not admitted into Gardens, so I have not enumerated them here.

The 1st Sort is the common Sea Ragwort, which has been supposed to grow naturally near the Sea in some Parts of England; but I have never yet met with it wild in any Part where I have been, nor have I heard that any other Person has seen it growing naturally here. It grows in great Plenty on the Sea Coast in France and Italy; this sends out many shrubby Stalks, which rise from 2 to 3 Feet high; they are hoary, and garnished with woolly Leaves 6 or 8 Inches long, jagged to the Mid-rib in 5 or 6 Parts; the Jaggs are opposite, narrowest at their Base, and at their Points are divided into 3 or 4 obtuse Segments; the Stalks have a few Leaves toward the Bottom of the same Shape, and are terminated with yellow Flowers growing in a Corymbus; these are succeeded by downy Seeds, which ripen in Autumn.

The Seeds of the 2d Sort I received from the Mediterranean, where it grows naturally. This hath shrubby Stalks, which rise 3 or 4 Feet high, covered with a hoary Down, and garnished with Leaves from 2 to 3 Inches long, and an Inch and a Half broad, standing on very long Foot Stalks; they are regularly sinuated on their Edges, in Form of winged Leaves; the under Side of the Leaves are hoary, but their upper Side are of a blackish green Colour. The Flowers grow in small Clusters at the End of the Branches, they are of a deep yellow Colour, and are succeeded by downy Seeds like the 1st. This is a very different Plant from the 1st, and always retains its Difference from Seeds. There are 2 Varieties of the 1st Sort, mentioned by Tournefort, which he found growing naturally in the Levant; but these I have frequently propagated by Seeds, and have always found them vary; sometimes the Leaves became green on both Sides, and at others only on their upper Side; so that these are not worthy of being noticed.

The 3d Sort grows naturally at the Cape of Good Hope, from whence the Seeds were brought to Holland

in 1697, where the Plants were raised, and have since been communicated to most of the curious Gardens in Europe. This hath a Root composed of many small Fibres; the Stalks are round, branching, and weak; they are herbaceous, hairy, and trail on the Ground if not supported. These grow 5 or 6 Feet long, dividing into a great Number of Branches, garnished with roundish indented Leaves, not unlike Ground-Ivy, hollowed at their Base; the Flowers are produced at the End of the Stalks in loose Umbels; they are radiated; the Rays are yellow like those of common Ragwort; the Disk is composed of Hermaphrodite Flowers of a dark Colour; the Seeds have a Down on their Top.

The fourth Sort grows naturally in Ethiopia. This rises with a shrubby Stalk 4 or 5 Feet high, dividing into several Branches garnished with grayish Leaves placed without Order, those on their lower Part being narrow and entire, but the others are indented on the Edges after the Manner of Hartthorn. The Flowers are produced in loose Umbels at the End of the Branches; they are yellow, and are succeeded by downy Seeds.

The 5th Sort grows naturally at the Cape of Good Hope. This rises with a round herbaceous Stalk, which afterward becomes ligneous, dividing into many Branches, from 3 to four Feet high, garnished with thick, succulent, grayish Leaves, placed without Order; these are narrow at their Base, and broad toward their Points, entire, and sit close to the Branches. The Flowers are produced on branching Foot Stalks at the End of the Branches, each Flower standing upon one of the Foot Stalks; they have broad yellow Rays, with a large Disk in the Middle, and are succeeded by downy Seeds.

The 6th Sort was discovered by the late Dr. Shaw, near Tunis in Africa, from whence he brought the Seeds. This sends out many ligneous Stalks from the Root, which spread out on every Side, declining toward the Ground, and are garnished with grayish Leaves, which are narrow at their Base, enlarging upward, and are broad at their Points, where they are rounded; these sit close to the Stalks. The Flowers are produced upon long, thick, succulent Foot Stalks at the End of the Branches; they are yellow; the Rays are sharp-pointed, and not much longer than the Empalement; the Disk is large, and the Florets are as long as the Empalement; the Seeds are crowned with a long Down.

The 7th Sort grows naturally at the Cape of Good Hope, from whence the Seeds were brought to Holland, and the Plants were raised in the Amsterdam Garden in 1699. This rises with a shrubby Stalk about the Thickness of a Man's Finger, 2 Feet high, which divide into many Branches; these are covered with a hoary Down, and are garnished with hoary Leaves about 3 Inches long and one broad, cut into many narrow Segments almost to the Mid-rib; these Segments are equal, parallel, and are indented at their Ends into 2 or 3 Points. The Flowers are produced on long Foot Stalks which arise from the Wings of the Stalks toward the End of the Branches they have large yellow Rays or Borders, with a Disk of Florets, and are preceded by oblong purple Seeds crowned with Down.

The 8th Sort grows naturally on the Hills near the Cape of Good Hope, and was raised from Seed in the Amsterdam Garden. This hath a low, shrubby, branching

ing Stalk; the Leaves are thick like those of *Sampfire*, and are cut into many narrow Segments. The Flowers are produced on short Foot Stalks at the End of the Branches; they are yellow, and shaped like the other Species of this Genus, and are succeeded by brown Seeds crowned with soft Down.

The 9th Sort grows naturally at the *Cape of Good Hope*. This hath a thick shrubby Stalk, dividing into several Branches, which rise 5 or 6 Feet high; the Leaves come out in Clusters from one Point, spread on every Side; they are smooth, narrow at their Base, enlarging gradually to their Points, which are rounded; their Edges are acutely indented like those of the *Holly*. From the Center of the Leaves arise the Foot Stalks of the Flowers, which are 5 or 6 Inches long, branching out into several smaller, each sustaining one yellow radiated Flower, shaped like the former; these are succeeded by slender Seeds crowned with Down.

The 10th Sort grows naturally in *Jamaica*, from whence the late Dr. *Houfoun* sent the Seeds to *England*. This rises with a shrubby Stalk 7 or 8 Feet high, covered with a hoary Down, and garnished with oval, spear-shaped Leaves, 4 Inches long, and an Inch and a Half broad at their Base gradually lessening to their Points; they are smooth, and of a dark green on their upper Side, but very white and woolly on their under, standing alternately on short woolly Foot Stalks. The upper Part of the Stalk is naked, and at the Top divides into 5 or 6 Foot Stalks, each sustaining a roundish Bunch of yellow radiated Flowers, which are succeeded by slender Seeds crowned with Down.

The 11st Sort was formerly preserved in Green-houses, and was supposed too tender to live abroad in the open Air; but later Experience has taught us that the Cold will not destroy it, provided it is planted on a lean dry Soil; but in rich moist Ground, these Plants grow too vigorous in Summer, so their Branches being replete with Moisture, they are sometimes killed in severe Winters. This is easily propagated by Slips or Cuttings during any of the Summer Months. These may be planted in a shady Border, and now and then refreshed with Water; in about 6 Weeks or 2 Months they will have good Roots: Then they may be transplanted to the Places where they are to remain, shading them from the Sun, and supplying them with Water till they have taken new Root; after which they will require no other Care but to keep them clean from Weeds. This Sort flowers most Part of Summer, but they have little Beauty; the Plants are preserved more for the Variety of their hoary divided Leaves.

The 2d Sort is not quite so hardy; if planted in a warm Situation, and on a dry Soil, it will live abroad through our ordinary Winters very well, but in severe Frosts they are sometimes killed. This may be propagated by Slips or Cuttings, as the first.

The 3d Sort is too tender to live in the open Air through the Winter, but may be preserved, with a little Protection, in hard Frost, and requires as much free Air as possible in mild Weather; so if sheltered under a Frame in Winter, it will thrive better than in a Green-house. It is easily propagated by Cuttings, as the 1st.

The 3d, 4th, 5th, 7th, 8th, and 9th Sorts are preserved in Green-houses through the Winter, but require

no artificial Warmth; if these are protected from Frost it is sufficient; and in mild Weather they must have a large Share of free Air. In Summer they must be placed abroad in a sheltered Situation, among other hardy exotic Plants, where they will add to the Variety, and flower great Part of the Summer. They may be all propagated by Cuttings during any of the Summer Months, planted on an old hot Bed, and covered with Glasses, shading them from the Sun in the Heat of the Day. When these have taken Root, they should be planted each into a separate Pot filled with soft loamy Earth, placing them in the Shade till they have taken new Root; then they may be removed to a sheltered Situation till Autumn, treating them in the same Way, as the old Plants.

The 6th Sort will live in the open Air, if planted in a warm Situation and a dry Soil. Some of these Plants have endured the open Air for more than 20 Years in the *Chelsea Garden*, without Protection. This is easily propagated by Cuttings, the same Way as the former.

The 10th Sort is too tender to live through the Winter in *England* without artificial Warmth, therefore the Plants should be placed in a Stove kept to a moderate Temperature of Warmth, for the Plants are apt to draw up weak when they are in too great Heat; these require to be frequently refreshed with Water in Winter, but it must not be given in too great Quantity during that Season. The latter End of *June* the Plants should be removed into the open Air, placing them in a warm sheltered Situation; and in warm dry Weather they will require a greater Quantity of Water. This Sort will grow by Cuttings, which should be planted on a moderate hot Bed the Beginning of *July*, and shaded till they have taken Root; then they may be each planted in a small Pot, filled with loamy Earth, placing them under a Frame till they have taken new Root, after which they must be gradually inured to the open Air, and treated as the old Plants.

OXALIS. *Lin. Gen. Plant.* 515. *Oxys: Tourn. Inst. R. H.* 88. *Tab.* 19. Wood Sorrel.

The Characters are,

The Emplacement of the Flower is short, permanent, and cut into 5 acute Parts. The Flower is of one Petal, cut into 5 obtuse indented Segments almost to the Bottom; it hath 10 erect hairy Stamina, terminated by roundish furrowed Summits, and a Germen with 5 Angles, supporting 5 slender Styles crowned by obtuse Stigmas. The Germen becomes a 5 cornered Capsule with 5 Cells, which open longitudinally at the Angles, containing roundish Seeds, which are thrown out with an Elasticity on the Touch when ripe.

The Species are,

1. *OXALIS scapo uniflora, foliis ternatis, radice squamoso-articulata Hort. Cliff.* 175. Wood Sorrel with one Flower on a Foot Stalk, trifoliate Leaves, and a scaly-jointed Root. This is the *Oxys flore albo. Tourn. Inst.* 88. Wood Sorrel with a white Flower.

2. *OXALIS caule ramoso diffuso, pedunculis umbelliferis. Hort. Cliff.* 175. Wood Sorrel with a branching diffusid Stalk, and umbellated Foot Stalks. This is the *Oxys luteo. J. B.* Yellow Wood Sorrel.

3. *OXALIS caule ramoso erecto, pedunculis umbelliferis. Flor. Virg.* 161. Wood Sorrel with a branching, upright Stalk, and umbellated Foot Stalks. This is the *Oxys lutea*,

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lutea, Americana, erectior, Tourn. Inst. R. H. 88. Upright yellow American Wood Sorrel.

4. *Oxalis pedunculis unifloris, caule dichotomo*. Lin. Sp. Plant. 443. Wood Sorrel with one Flower on a Foot Stalk, and Stalks divided by Pairs. This is the *Oxys bulbosa Ethiopica minor, folio cordato, flore ex albido purpurascens*. Tourn. Inst. 89. Smaller bulbous Ethiopian Wood Sorrel, with a Heart-shaped Leaf, and a purplish white Flower.

5. *Oxalis scapo uniflora, foliis ternatis, radice bulbosa*. Hort. Cliff. 175. Wood Sorrel with a Foot Stalk supporting one Flower, trifoliate Leaves, and a bulbous Root. This is the *Oxys bulbosa Africana, rotundifolia caulibus & floribus purpureis amplis*. Hort. Amst. 1. p. 41. Tab. 21. African bulbous Wood Sorrel, having a round Leaf, large purple Stalks and Flowers.

6. *Oxalis scapo umbellifero, foliis ternatis bipartitis*. Lin. Sp. Plant. 434. Wood Sorrel with an umbelliferous Stalk, and trifoliate Leaves divided in two Parts. This is the *Oxalis bulbosa pentaphylla & hexaphylla, floribus magnis luteis & copiosis*. Burm. Afr. 80. Tab. 29. Bulbous Wood Sorrel with five or six Leaves, and large yellow Flowers in Abundance.

7. *Oxalis caule erecto fruticoso, foliis ternatis, impari maximo*. Wood Sorrel with an upright shrubby Stalk, and trifoliate Leaves, the middle one being very large. This is the *Oxys lutea frutescens, trifolii bituminosa facie*. Plum. Cat. 2. Yellow, shrubby Wood Sorrel with the Appearance of bituminous Trefoil.

The 1st Sort grows naturally in moist shady Woods, and close to Hedges in England, so is seldom admitted into Gardens; though whoever is fond of acid Herbs in Salads, can scarce find a more grateful Acid in any other Plant. The Roots are composed of many scaly Joints, which propagate in great Plenty. The Leaves arise immediately from the Roots on single long Foot Stalks, are composed of 3 Heart-shaped Lobes, which meet in a Center where they join the Foot Stalk, and are of a pale green and hairy; between these come out the Flowers upon pretty long Foot Stalks, each sustaining one large white Flower of the open Bell Shape. These appear in April and May, and are succeeded by five-cornered oblong Seed Vessels, having 5 Cells inclosing small brownish Seeds; when these are ripe, the Seed Vessels burst open on the least Touch, and cast out the Seeds to a considerable Distance. This is the Sort directed for medicinal Use in the Dispensaries, but those People, who supply the Market with Herbs, generally bring the 3d Sort, which is now become common in the Gardens; but this hath very little acid, so is unfit for the Purpose; but as it rises with an upright branching Stalk, so it is soon gathered and tied up in Bunches; whereas the Leaves of the 1st grow singly from the Root, and require more Time in gathering. There is a Variety of the 1st Sort with a purplish Flower, which grows naturally in the North of England, but, as it does not differ in any other Respect, I have not enumerated it.

The 2d Sort is an annual, which grows naturally in Woods and shady Places in Italy and Sicily. The Root of this is long, slender, and fibrous; the Stalks trail on the Ground, spreading out 8 or 9 Inches wide on every Side, dividing into small Branches; the Leaves

stand upon pretty long Foot Stalks, and are composed of 3 Heart-shaped Lobes, which have deeper Indentures at their Points, than those of the 1st Sort. The Flowers are yellow, growing in Form of an Umbel upon long slender Foot Stalks, arising from the Side of the Branches. These appear in June and July, and are succeeded by Seed Vessels near an Inch long, which open with Elasticity, and cast out the Seeds.

The 3d Sort grows naturally in Virginia and other Parts of North America, from whence the Seeds were formerly brought to Europe; but where-ever this Plant has been once introduced and suffered to ripen Seeds, it has become a common Weed. This is an annual Plant, rising with a branching, herbaceous Stalk 8 or 9 Inches high; the Leaves stand on very long Foot Stalks, and are shaped like those of the 2d Sort. The Flowers are yellow, standing, in a Sort of Umbel, on long, slender, erect Foot Stalks; the Seed Vessels and Seeds are like those of the 2d Sort.

These 3 Sorts require no particular Culture; if the Roots of the 1st Sort are taken up and transplanted in a shady moist Border, they will thrive and multiply exceedingly, and, if kept clean from Weeds, will require no other Care. If the Seeds of the other two Sorts are sown in an open Border, or permitted to scatter, the Plants will rise freely, and require no Care.

The 4th Sort hath a roundish bulbous Root, from which come out slender Stalks about 6 Inches high, which divide into Branches by Pairs, and from the Divisions come out the Foot Stalks of the Leaves; these are long, slender, and sustain a trifoliate Leaf composed of 3 small roundish, Heart-shaped Lobes. The Foot Stalks of the Flowers are long, slender, and arise from the Division of the Stalks, each sustaining one purplish Flower about the same Size and Shape as those of the first Sort. This flowers in May, June, and July, and sometimes produces ripe Seeds in England. It grows naturally at the Cape of Good Hope, so is too tender to live through the Winter in the open Air in England; but if sheltered from hard Frost, under a common Frame, in Winter, it will require no other Protection. It propagates in Plenty by Offsets from the Root, as also by Bulbs, which come out from the Side of the Stalks.

The 5th Sort grows naturally at the Cape of Good Hope in such Plenty that the Earth, which came from thence, with some Plants to England, was full of it. This hath a roundish bulbous Root, covered with a brown Skin sending out strong Fibres which strike deep into the Ground; the Leaves are trifoliate, composed of 3 roundish, large, hairy Lobes, but little indented at the Top; these stand on long slender Foot Stalks, which arise from a thick short Stalk adhering to the Root. The Foot Stalks of the Flowers arise between the Leaves of the Stalk, each supporting one large purple Flower; these appear in January and February, but are rarely succeeded by Seeds here, but the Roots put out Offsets in great Plenty, whereby it is propagated. This Sort will not thrive in Winter in the open Air here, so the Roots should be planted in Pots, and sheltered under a common Frame in Winter, admitting as much free Air as possible in mild Weather, otherwise the Leaves will draw up weak; for the Leaves of this come out in October, and continue growing till May, when they begin to decay.

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decay. The Roots may be transplanted any Time after the Leaves decay, till they begin to push out again.

The 6th Sort is also a Native of the *Cape*; the Roots of this are bulbous; the Leaves stand on long slender Foot Stalks, which arise from a short Stalk or Head; they are composed of 3 Lobes, for the most part divided into 2 Parts almost to their Base. The Foot Stalks of the Flowers are 5 or 6 Inches long, sustaining several large yellow Flowers ranged in Form of an Umbel. These appear in *March*, and are sometimes succeeded by Seeds here. This requires the same Treatment as the 5th.

The 7th Sort was discovered by *Plumier* in the *French Colonies* in *America*, and was since found growing plentifully at *La Vera Cruz* by the late Dr. *Houssoun*, who sent it to *England*. It rises with a shrubby Stalk a Foot and a Half high, sending out several slender Branches, garnished with trifoliate small Leaves, composed of 3 oval Lobes, the middle one being twice as large as the side ones. These are placed by Pairs opposite, and

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sometimes by Threes round the Stalk, standing on short Foot Stalks. The Foot Stalks of the Flowers arise from the Wings of the Stalks, are near 2 Inches long, each sustaining 4 or 5 yellow Flowers, whose Petals are not much longer than the Empalement; each of these have a smaller Foot Stalk which is crooked, so the Flowers hang downward.

This Sort is much tenderer than either of the former, so requires to be placed in a Stove kept to a moderate Degree of Warmth in Winter. It is propagated by Seeds, which must be sown in Pots, and plunged into a moderate hot Bed; when the Plants come up, they should be each planted in a separate Pot filled with light sandy Earth, and plunged into a fresh hot Bed, shading them from the Sun till they have taken new Root; after which they must be treated in the same Manner as other tender Plants from the same Country.

OX-EYE. See *Bupthalmum*.

OXYACANTHA. See *Berberis*.

OXYS. See *Oxalis*.

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PADUS. *Lin. Gen. Edit. prior.* 476. *Edit.* 5. *Prunus.* 546. *Cerasus* & *Laurocerasus.* *Tourn. Inst.* The Bird Cherry, or Cherry Laurel.

The Characters are,

The Empalement of the Flower is Bell-shaped, of one Leaf indented in five Parts at the Brim which spread open. The Flower hath 5 large roundish Petals, which spread open, and are inserted in the Empalement. It hath from 20 to 30 Awl-shaped Stamina, which are inserted in the Empalement, terminated by roundish Summits, and a roundish Germen supporting a slender Style, crowned by an entire obtuse Stigma. The Germen becomes a roundish Fruit, inclosing an oval-pointed Nut having rough Furrows.

This Genus of Plants was by Dr. *Linnaeus*, in the former Editions of his Method, separated from the Cherries, to which they had been before joined, because the Furrows of the Nuts in this Genus were obtuse, whereas those of the Cherries are acute; but there is a more obvious Distinction between them, which is, the Flowers of the *Padus* are ranged in a long Bunch, and those of the Cherry have their Foot Stalks arising from one Joint; but in the last Edition, he has joined this Genus, the Cherry and Apricot, to the Plum, making them only Species of the same Genus, in which, I think, he has exceeded the Boundaries of Nature; for although the *Padus* and *Cerasus* may with Propriety be joined in the same Genus, yet these ought by no Means to be joined to the *Prunus*; for it is well known, that the Cherry will not grow by grafting or budding on the Plum Stock, nor the Plum upon Cherry Stocks, though there are no Instances of two Trees of the same Genus, which will not grow on each other, however different their exterior Appearance may be.

The Species are,

1. *PADUS glandulis duobus, basi foliorum subjectis.* *Hort. Cliff.* 185. Bird Cherry with two Glands at the Base of the Leaves. This is the *Cerasus racemosa, syl-*

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vestris, fructu non eduli. *C. B. P.* 451. Branching wild Cherry with a Fruit not eatable.

2. *PADUS foliis lanceolato-ovatis deciduus, petiolis biglandulosis.* *Tab.* 196. *fol.* 2. Bird Cherry with Spear-shaped, oval, deciduous Leaves, whose Foot Stalks have two Glands. This is the *Cerasus racemosa, sylvestris, fructu non eduli, rubra* *H. R. Par.* Branching wild Bird Cherry with a red Fruit, which is not eatable, and commonly called by the Gardeners, *Cornish Cherry*.

3. *PADUS foliis oblongo-ovatis serratis acuminatis deciduus, basi antice glandulosis.* Bird Cherry with oblong, oval, sawed, acute-pointed, deciduous Leaves, and Glands on the fore Part of the Foot Stalk. This is the *Cerasi similis arbuscula Mariana, padi folio, flore albo parvo racemosa.* *Pluk. Mant.* 43. *Catech. Car.* 1. p. 28. *American Bird Cherry*.

4. *PADUS foliis sempervirentibus lanceolato-ovatis.* *Hort. Cliff.* 42. Bird Cherry with ever-green, Spear-shaped, oval Leaves. This is the *Laurocerasus.* *Clus. Hist.* 1. p. 4. The common Laurel.

5. *PADUS foliis oblongo-ovatis sempervirentibus eglandulosis.* Bird Cherry with oblong, oval, ever-green Leaves having Glands. This is the *Laurocerasus Lusitana minor.* *Tourn. Inst.* 628. Smaller *Portugal Laurel*, called *Asarero* by the *Portuguese*.

6. *PADUS foliis lanceolatis acutè denticulatis sempervirentibus.* Ever-green Bird Cherry with Spear-shaped Leaves, having small acute Indentures, called in *America* *Bastard Mohogany*.

The 1st Sort grows naturally in the Hedges in *Yorkshire*, and many northern Counties in *England*, also in some few Places near *London*, but is propagated as a flowering Shrub in the Nursery Gardens for Sale. This rises with several woody Stalks to the Height of 10 or 12 Feet, which will grow to have Stems 9 or 10 Inches Diameter, if they are permitted to stand; but as the Fashions of Gardens have been frequently altering for 50 or 60 Years,

Years past, there are few Places where any of the ornamental flowering Trees have been suffered to remain. The Branches of this Tree grow wide and scattering; they are covered with a purplish Bark; they are garnished with oval Spear-shaped Leaves placed alternate, slightly sawed on their Edges, and have two small Protuberances or Glands, at their Base. The Flowers are produced in long loose Bunches, from the Side of the Branches; they have 5 roundish white Petals, which are much smaller than those of the Cherry, and are inserted in the Border of the Empalement; and within these are a great Number of Stamina, which also are inserted in the Empalement. The Flowers stand each upon a short Foot Stalk, and are ranged alternately along the principal Foot Stalk; they have a strong Scent, which is very disagreeable to most Persons. They appear in May, and are succeeded by small roundish Fruit, which are first green, afterward turn red, and when ripe, are black, inclosing a roundish furrowed Stone or Nut, which ripens in August.

The 2d Sort grows naturally in *Armenia*, from whence I received the Seeds, but has been many Years propagated in the Nursery Gardens about *London*, where it is generally called, *Cornish Cherry*. This Sort has been often confounded with the 1st, many late Writers in Botany having supposed it the same Species; but I have raised both Sorts from Seeds, and always found the young Plants retain their Difference. This rises with a straight upright Stem more than 20 Feet; the Branches are shorter, and grow closer together than those of the 1st, so naturally form regular Heads; the Leaves of this are shorter and broader than those of the other, and not so rough; the Flowers grow in closer shorter Spikes, which stand more erect; the Fruit is larger, and red when ripe. This flowers a little after the first Sort.

The 3d Sort grows naturally in *Virginia*, and other Parts of *North America*. This rises with a thick Stem, from 10 to 30 Feet high, dividing into many Branches, which have a dark purple Bark, and are garnished with oval Leaves placed alternately on short Foot Stalks; they are of a lucid green, and slightly sawed on their Edges, continuing in Verdure as late in Autumn as any of the deciduous Trees. The Flowers come out in Bunches like those of the 2d Sort, and are succeeded by larger Fruit, which is black when ripe, and is soon devoured by the Birds. The Wood is beautifully veined with black and white, and will polish very smooth, so is frequently used for Cabinet Work; as is also the Wood of the first Sort, which is much used in *France*, where it is called, *Bois de Sainte-Lucie*.

The 4th Sort is the Common Laurel, so well known as to need no Description. This grows naturally about *Trebisond*, near the *Black Sea*, and was brought to *Europe* about the Year 1576, but is now become very common, especially in the warmer Parts of *Europe*.

The 5th Sort was brought to *England* from *Portugal*, but whether it is a Native of that Country, or was introduced there from some other Country, is hard to determine. The *Portuguese* call it *Azeraro*, or *Azerero*. This was supposed to have been but a low ever-green Shrub, but by Experience we find, that when it is in a proper Soil, it will grow to a large Size. There are at present some of these Trees, whose Trunks are more

than a Foot Diameter, and 10 or 12 Feet high, which are not of many Years standing, and are well furnished with Branches, which when young have a reddish Bark; the Leaves are shorter than those of the common Laurel, approaching nearer to an oval Form; they are of the same Consistence, and of a lucid green, which mixing with the red Branches, make a beautiful Appearance. The Flowers are produced in long loose Spikes from the Side of the Branches; they are white, and shaped like those of the common Laurel appearing in June, and are succeeded by oval Berries smaller than those of the Laurel; they are first green, then red, and when ripe are black, inclosing a Stone like the Cherry.

The Seeds of the 6th Sort were sent from *Carolina*, by the Title of Bastard Mohogany, from the Colour of the Wood, which is somewhat like Mohogany. This seems to be little more than a Shrub, if we may judge from its Growth here; the Stalk does not rise in Height, but sends out lateral Branches, which spread on every Side, covered with a brown Bark, and garnished with Spear-shaped Leaves near 2 Inches long, and 3 Quarters broad, with small acute Indentures on the Edges; they stand alternately on very short Foot Stalks, and are of a lucid green, continuing their Verdure all the Year. This has not flowered in *England*, so I can give no Account of it; but by the Seeds and Description of its Flowers, it belongs to this Genus.

This Plant will live in the open Air here, if planted in a warm Situation and sheltered in severe Frost, which, if exposed, often destroys them, especially while the Plants are young; but when they have acquired Strength, there is no doubt of their thriving very well in the open Ground. It may be propagated as the *Portugal Laurel* from the Berries, and if the Branches are laid down they will take Root, but the Cuttings will not grow, so far as I have experienced.

The three first Sorts are easily propagated either by Seeds or Layers; the Seeds they should be sown in the Autumn, for if they are kept out of the Ground till Spring, they seldom grow till the second Year. These may be sown on a Bed or Border of good Ground, in the same Way as Cherry Stones designed for Stocks; and the young Plants may be treated in the same Manner, planting them out in a Nursery, where they may stand 2 Years to get Strength, and then may be transplanted to the Places where they are to remain. They are usually intermixed with other flowering Shrubs, in Wilderness Work, where they add to the Variety.

If they are propagated by Layers, the young Shoots should be laid down in Autumn, which will have good Roots in Twelvemonths, when they may be separated from the old Plants, and transplanted into a Nursery for a Year or two, to get Strength, and may then be removed to the Places where they are to grow.

The 3d Sort will grow to be a very large Tree when planted in a moist Soil, but in dry Ground it rarely rises to be more than 20 Feet high. There have been some Plants of late raised from Seeds sent from *Carolina*, which have all the Appearance of the 3d Sort, but are of much humbler Growth; whether this may proceed from their being brought from a warmer Climate, and not agreeing with the Cold of our Winters so well, or whether

they are a different Species from that, I cannot yet determine, as they have not produced Fruit here.

The Laurel may be easily propagated by planting the Cuttings; the best Time for this is in *September*, as soon as the autumnal Rains fall to moisten the Ground; the Cuttings must be the same Year's Shoots; and if they have a small Part of the former Year's Wood to their Bottom, they will more certainly succeed, and form better Roots. These should be planted in a soft loamy Soil about 6 Inches deep, pressing the Earth close to them. If these are properly planted, and the Ground is good, there will few of the Cuttings fail; and if they are kept clean from Weeds the following Summer, they will have made good Shoots by Autumn, when they may be transplanted into a Nursery, where they may grow 2 Years to get Strength, and then should be removed to the Places where they are to remain. These Plants were formerly kept in Pots and Tubs; and preserved in Green-houses in Winter: but afterward they were planted against warm Walls, to preserve them, being frequently injured by severe Frost. After this the Plants were trained into Pyramids and Globes, and constantly kept sheered; by which the broad Leaves were generally cut in the Middle, which rendered the Plants very unsightly. Of late they have been more properly disposed in Gardens, by planting them to border Woods, and the Sides of Wilderness Quarters; for which Purpose we have but few Plants so well adapted; for it will grow under the Drip of Trees, in Shade or Sun; and the Branches will spread to the Ground, so as to form a Thicket; the Leaves being large, and having a fine glossy green Colour, set off the Woods and other Plantations in Winter, when other Trees have cast their Leaves; and in Summer they make a good Contrast with the Green of the other Trees. These Trees are sometimes injured in very severe Winters, especially where they stand single, and are much exposed; but where they grow in Thickets, and are screened by other Trees, they are seldom much hurt; for in those Places it is only the young tender Shoots which are injured, and there will be new Shoots produced immediately below these, to supply their Place; so that in one Year the Damage will be repaired. But whenever such severe Winters happen, these Trees should not be cut or pruned, till after the following *Midsummer*; by which Time it will appear what Branches are dead, which may then be cut away, to the Places where the new Shoots are produced; for by hastily cutting these Trees in Spring, the drying Winds have free Ingress to the Branches; whereby the Shoots suffer as much, if not more, than they had done by the Frost.

These Trees are also very ornamental, when they are mixed with other ever-green Trees, to form Thickets, or shut out the Appearance of disagreeable Objects; for the Leaves, being very large, make a good Blind, and are equally useful for screening from Winds; so that when they are planted between flowering Shrubs, they may be trained so as to fill up the Vacancies in the Middle of such Plantations; and will answer the Purpose of screening in Winter, and shutting out the View through the Shrubs in all Seasons.

In warm Countries this Tree grows to a large Size;

so that in some Parts of *Italy* there are large Woods of them; but we cannot hope to have them grow to so large Stems in *England*; for should these Trees be pruned up, in order to form them into Stems, the Frost would then become much more hurtful to them, than in the Manner they usually grow, with their Branches to the Ground: However, if they are planted pretty close together in large Thickets, and permitted to grow rude, they will defend each other from the Frost, and will grow to a considerable Height: An Instance of which is now in that noble Plantation of ever-green Trees, made by his Grace the Duke of *Bedford*, at *Woburn-Abbey*; where there is a considerable Hill, covered entirely with Laurels; and in the other Parts of the same Plantation, there are great Numbers of these intermixed with other ever-greens, where they are already grown to a considerable Size, and make a noble Appearance.

There are some Persons who propagate these Trees from their Berries, which is certainly the best Way to obtain good Plants; for those raised from Seeds have a Disposition to an upright Growth; whereas almost all those raised from Cuttings, or Layers, incline more to an horizontal Growth, and produce a greater Number of lateral Branches. When any Person is desirous to propagate this Tree by Seeds, the Berries must be guarded from the Birds, otherwise they will devour them before they are perfectly ripe; which is seldom earlier than the latter End of *September*, or the Beginning of *October*, for they should hang until the outer Pulp is quite black. When these Berries are gathered, they should be sown soon after; for when they are kept out of the Ground till Spring, they frequently miscarry; and there will be no Hazard in sowing them in Autumn, provided they are put in a dry Soil; and if the Winter should prove severe, the Bed in which they are sown should be covered with rotten Tan, Straw, Peas Haulm, or any light Covering, to prevent the Frost from penetrating the Ground. The best Way will be to sow the Berries in Rows at about 6 Inches Distance, and one Inch asunder in the Rows; if Drills are made about 3 Inches deep, and the Berries scattered in them, and the Earth drawn over them, it will be a very good Method. The following Spring the Plants will appear, when they should be kept clean from Weeds; if the Season should prove dry, and they are duly watered, the Plants will make so good Progress, as to be fit for transplanting the following Autumn, when they should be carefully taken up, and planted in a Nursery, placing them in Rows at 3 Feet asunder, and the Plants one Foot Distance in the Rows. In this Nursery they may remain 2 Years, by which time they will be fit to transplant where they are to remain.

The best Season for transplanting these Plants is in Autumn, as soon as the Rain has prepared the Ground for Planting; for although they often grow when removed in Spring, yet they do not take so well, nor make so good Progress, as those which are removed in Autumn, especially if the Plants are taken from a light Soil, which generally falls away from their Roots; but if they are taken up with Balls of Earth to their Roots, and removed but a small Distance, there will be no Danger of transplanting them in the Spring, provided it is done before they begin to shoot, for as these Plants will shoot

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shoot very early in Spring, so if they are removed after they have shot, the Shoots will decay, and many Times the Plants entirely fail.

Some Persons of late, have banished these Plants from their Gardens, supposing them of a poisonous Quality, because the distilled Water has proved so in many Instances; but however the distilled Water may have been found destructive to Animals, yet from numberless Experiments which have been made both of the Leaves and Fruit, it hath not appeared that there is the least hurtful Quality in either; so that the whole must be owing to the Oil which may be carried over in Distillation.

The Berries have been long used to put into Brandy, to make a Sort of Ratafia, and the Leaves have also been put into Custards, to give them an agreeable Flavour; these have been for many Years much used, yet there has been no one Instance of their having done the least Injury; as to the Berries, I have known them eaten in great Quantities without Prejudice.

There are some Persons who have grafted the Laurel upon Cherry Stocks, with Design to enlarge the Trees, but although they will take very well upon each other, yet they seldom make much Progress when either the Laurel is grafted on the Cherry, or the Cherry upon the Laurel; so it is only a Curiosity, attended with no real Use: I would recommend to Persons who have this Curiosity, to graft the Laurel upon the Cornish Cherry, rather than any other Sort of Stock, because the Graft will unite better with this; and as it is a regular Tree and grows large, so it will better answer the Purpose of producing large Trees.

The Portugal Laurel may be propagated as the common Laurel, either by Cuttings, Layers, or Seeds. If the Cuttings are planted at the same Season, and in the same Way as hath been directed for the common Laurel, they will take Root very freely; or if the young Branches are layed in Autumn, they will take Root in one Year, and may then be removed into a Nursery, where they may grow a Year or two to get Strength, and then transplanted where they are to remain.

But although both these Methods are very expeditious for propagating these Plants, yet I would recommend raising them from the Berries, especially where they are designed for tall Standards; for the Plants propagated by Cuttings and Layers, put out more lateral Branches and become bushy, but are not so well inclined to grow upright, as those which come from Seeds; and as there are now many Trees in the English Gardens which produce Plenty of Berries every Year, so if they are guarded from Birds till they are ripe, there may be a Supply sufficient to raise Plants enough, without propagating them any other Way. These Berries must be sown in Autumn, and treated in the same Way as the common Laurel.

This Tree delights in a gentle loamy Soil, not too wet nor over dry, though it will grow on almost any Soil; but the Plants do not make so great Progress, nor appear so beautiful, when planted in a very dry Soil, or in Ground that is too wet. The Time of transplanting this, is the same as for the common Laurel.

This is much harder than the common Laurel, for in the severe Frost of the Year 1740, when great Num-

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bers of Laurels were entirely killed, and most of them lost their Verdure, this remained unhurt in perfect Verdure, which renders it more valuable; and as by the Appearance of some now in the Gardens, they seem as if they will grow to a large Size, so it is likely to be one of the most ornamental Ever greens we have.

PÆONIA. Tourn. Inst. R. H. 273. Tab. 146. Lin. Gen. Plant. 600. The Peony; in French, *Pivoine*.

The Characters are,

The Flower has a permanent Empalement, composed of 5 concave reflexed Leaves, unequal in Size and Position. The Flower hath 5 large roundish concave Petals spread open, and a great Number of short hairy Stamina, terminated by large, oblong, four cornered Summits, with 2, 3, or 4, oval, erect, hairy Germen in the Center, having no Styles; but have oblong, compressed, obtuse, coloured Stigmas. The Germen become so many oval, oblong, reflexed, hairy Capsules, having one Cell, opening longitudinally, containing several oval, shining coloured Seeds, fixed to the Furrow.

The Species are,

1. PÆONIA foliis lobatis ex ovato-lanceolatis. Haller. Helv. 311. Peony with lobated Leaves which are oval and Spear-shaped. This is the *Pæonia folio nigricante splendido, quæ mas.* C. B. P. 323. Peony with dark shining Leaves, otherwise Male Peony.

2. PÆONIA foliis difformiter lobatis. Haller. Helv. 311. Peony with difformed lobated Leaves. This is the *Pæonia communis, vel femina.* C. B. P. 323. Common or female Peony.

3. PÆONIA foliis difformiter lobatis, lobis incis, petalis florum rotundioribus. Peony with difformed lobated Leaves which are cut, and rounder Petals to the Flower. This is the *Pæonia peregrina, flore saturatè rubente.* C. B. P. 324. Foreign Peony, with a deep red Flower.

4. PÆONIA foliis lobatis, lobis lanceolatis integerrimis. Peony with lobated Leaves, whose Lobes are Spear-shaped and entire. This is the *Pæonia femina, flore pleno rubro majore.* C. B. P. 324. Female Peony, with a larger double red Flower.

5. PÆONIA foliis difformiter lobatis pubescentibus. Peony with difformed lobated Leaves, which are downy.

6. PÆONIA foliis lobatis, lobis ovatis infernè incanis. Peony with lobated Leaves, whose Lobes are oval and hoary on their under Side. This is the *Pæonia Lusitânica, flore simplici odoro.* Juss. Peony of Portuga, with a single sweet Flower.

The 1st Sort here enumerated, is the common male Peony, which grows naturally in the Woods on the Helvetian Mountains. The Root is composed of several oblong Knobs, shaped like the Dugs of a Cow, which hang by Strings fastened to the main Head; the Stalks rise about 2 Feet and a Half high, garnished with Leaves composed of several oval Lobes, some of which are cut into 2 or 3 Segments; they are of a lucid green on their upper Side, but hoary on their under. The Stalks are terminated by large single Flowers composed of 5 or 6 large roundish red Petals, inclosing a great Number of Stamina, terminated by oblong yellow Summits. In the Center is situated 2, 3, or sometimes 5 Germen, which join together at their Base, they are covered with a whitish hairy Down; these afterward spread asunder, and open longitudinally, exposing the

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roundish Seeds, which are first red, then purple, and when perfectly ripe turn black. The Flowers appear in May, and the Seeds ripen in Autumn.

There is one Variety of this with pale, and another with white Flowers; as also one whose Leaves have larger Lobes; but as these are supposed to be only feminal Variations, so I have not enumerated them here.

The 2d Sort is called the Female Peony; the Roots of this are composed of several roundish thick Knobs or Tubers, which hang below each other, fastened with Strings; the Stalks are green, and rise about the same Height as the former; these are garnished with Leaves, composed of several unequal Lobes, variously cut into many Segments; they are of a paler green than those of the 1st, and are hairy on their under Side; the Flowers are smaller, and of a deeper purple Colour. It flowers at the same Time as the first.

There are several Varieties of this Sort with double Flowers, cultivated in the *English* Gardens; these differ in the Size and Colour of their Flowers, but are supposed to have been accidentally obtained from Seeds.

The 3d Sort grows naturally in the *Levant*; the Roots of this are composed of roundish Knobs like those of the 2d Sort, as are also the Leaves, but are of a thicker Substance; the Stalks do not rise so high, the Flowers have a greater Number of Petals. This flower a little after the other. The large double purple Peony, I suspect is a Variety of this Sort.

The 4th Sort hath Roots like the 2d; the Stalks are taller, and of a purplish Colour; the Leaves are much longer, the Lobes are Spear shaped and entire; the Flowers are large, and of a deep red Colour. This flowers at the same Time as the two first Sorts.

The Seeds of the 5th Sort were brought from the *Levant*, and from them, Plants were raised, which produced single, and others double Flowers, of the same Shape, Size, and Colour. The Roots of these are composed of oblong fleshy Tubers or Knobs, they are of a pale Colour, and hang by Strings like the other Species. The Stalks rise about 2 Feet high, of a pale green, and are garnished with Leaves composed of several Lobes, irregular in Shape and Size, some of them having but six, and others 8 or 10 Spear-shaped Lobes; there are some cut into 2, some 3 Segments, and others are entire, they are of a pale green, and downy on their under Side. The Stalks are terminated by one Flower of a bright red Colour, a little less than that of the female Peony, and have fewer Petals; they have a great Number of Stamina, and sometimes 2 at others 3 Germen, like those of the female Peony, but shorter and whiter. This flowers a little later than the common Peony.

The Seeds of the 6th Sort were sent to the *Chellsea* Garden by Dr. de *Jussieu*, who brought them from *Portugal*, where the Plants grow naturally. The Root of this is not composed of roundish Tubers or Knobs, but hath 2 or 3 long taper forked Fangs like Fingers. The Stalk rises little more than a Foot high, and is garnished with Leaves composed of 3 or 4 oval Lobes, of a pale Colour on their upper Side, and hoary on their under; the Stalk is terminated by a single Flower of a bright red Colour, smaller than either of the former, and of

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an agreeable sweet Scent. This flowers about the same Time with the common Sort.

The first of these Sorts is chiefly propagated for the Roots, which are used in Medicine; for the Flowers being single, do not afford near so much Pleasure as those with double Flowers, nor will they abide near so long in Beauty.

All the Sorts with double Flowers are preserved in curious Gardens for the Beauty of their Flowers, which, when intermixed with other large growing Plants in the Borders of large Gardens, will add to the Variety; and the Flowers are very ornamental in Basins or Flower Pots, when placed in Rooms.

They are all extremely hardy, and will grow in almost any Soil or Situation, which renders them more valuable; for they will thrive under the Shade of Trees, and in such Places they will continue much longer in Beauty.

They are propagated by parting their Roots, which multiply very fast. The best Season for transplanting them is toward the latter End of *August*, or the Beginning of *September*; for if they are removed after their Roots have shot out new Fibres, they seldom flower strong the succeeding Summer.

In parting these Roots, always preserve a Bud upon the Crown of each Offset, otherwise they will come to nothing; nor should you divide the Roots too small (especially if you Regard their blowing the following Year); for when their Offsets are weak, they many Times do not flower the succeeding Summer, or at least produce but one Flower on each Root: But where you would multiply them in Quantities, you may divide them as small as you please, provided there be a Bud to each Offset; but then they should be planted in a Nursery Bed for a Season or two, to get Strength, before they are placed in the Flower Garden.

The single Sorts may be propagated from Seeds (which they generally produce in large Quantities, where the Flowers are permitted to remain); which should be sown in the Middle of *August* upon a Bed of light fresh Earth, covering them over about half an Inch thick with the same light Earth. The Spring following the Plants will come up, when they should be carefully cleared from Weeds, and in very dry Weather refreshed with Water, which will greatly forward their Growth. In this Bed they should remain 2 Years before they are transplanted, observing in Autumn, when the Leaves are decayed, to spread some fresh rich Earth over the Beds about an Inch thick, and constantly to keep them clear from Weeds.

When you transplant them (which should be done in *September*;) you must prepare some Beds of fresh light Earth, which should be dug, and well cleaned from the Roots of all noxious Weeds; then plant the Roots therein 6 Inches asunder, and about 3 Inches deep. In these Beds they may remain until they flower, after which they may be transplanted where you design they should grow. It is very probable there may be some Varieties obtained from the Seeds of these Plants, as is common in most other Flowers; so that those which produce beautiful Flowers may be placed in the Flower Garden, but such as continue single or ill coloured, may be planted in Beds for medicinal Use.

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The *Portugal Peony* may also be propagated by Seeds, or parting the Roots, as the other Sorts, but should have a lighter Soil and a warmer Situation. The Flowers of this Kind are single, but smell very sweet, which renders it worthy of a Place in every good Garden.

PALIURUS. *Tourn. Inst. R. H.* 616. *Tab.* 387. *Rhamnus. Lin. Gen. Plant.* 235. Christ's Thorn.

The Characters are,

The Flower has no Empalement. It hath 5 Petals which are ranged circularly, and end in acute Points. It hath 5 Stamina, which are inserted in the Scales under the Petals, terminated by small Summits, and a roundish trifid Germen, supporting 3 short Styles, crowned by obtuse Stigmas. The Germen becomes a Buckler-shaped Nut divided into 3 Cells, each containing one Seed.

We know but one Species of this Genus, viz.

PALIURUS. *Dod. Pempt.* 848. Christ's Thorn. This is the *Rhamnus aculeis geminatis, inferiore reflexo, floribus trigynis. Hort. Cliff.* 69. Prickly Buckthorn with double Thorns, the under ones of which are reflexed, and Flowers containing three Germina.

This Plant grows naturally in the Hedges in *Palestine*; it rises with a pliant shrubby Stalk to the Height of 8 or 10 Feet, sending out many weak slender Branches, garnished with oval Leaves placed alternately, standing on Foot Stalks near one Inch long; these have 3 longitudinal Veins, and are of a pale green. The Flowers come out at the Wings of the Stalk in Clusters, almost the Length of the young Branches; they are of a greenish yellow Colour appear in *June*, and are succeeded by broad, roundish, Buckler-shaped, Seed Vessels, which have Borders like the Brims of a Hat, the Foot Stalks being fastened to the Middle; these have 3 Cells, each containing one Seed.

This is by many Persons supposed to be the Plant from which the crown of Thorns, which was put upon the Head of our Saviour, was composed; the Truth of which is supported by many Travellers of Credit, who affirm that this is one of the most common Shrubs in the Country of *Judea*; and from the Pliability of its Branches, which may be easily wrought into any Figure, it may afford a Probability.

This Shrub grows wild in most Parts of the *Levant*, as also in *Italy, Spain, Portugal*, and the South of *France*, especially near *Montpelier*, from whence their Seeds may be procured; for they do not ripen in *England*. These Seeds should be sown as soon as possible, after they arrive, in a Bed of light Earth, and the Plants will come up the following Spring; but when the Seeds are kept out of the Ground till Spring, they will not come up till the next Year, and very often fail; therefore it is much the best Way to sow them in Autumn. These seedling Plants may be transplanted the following Season into a Nursery to get Strength, before they are planted out for good.

It may also be propagated by laying down its tender Branches in the Spring of the Year, which if carefully supplied with Water in dry Weather, will take Root in a Year's Time, and may then be taken off from the old Plant, and transplanted where they are to remain.

The best Time for transplanting this is in Autumn, soon after the Leaves decay, or the Beginning of *April*,

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just before it begins to shoot, observing to lay some Mulch upon the Ground to prevent their Roots from drying, also to refresh them now and then with a little Water until they have taken fresh Root after which they will require but very little Care. They are very hardy, and will grow to 10 or 12 Feet high, if planted in a dry Soil, and a warm Situation. There is little Beauty in this Plant; but it is kept in Gardens as a Curiosity.

PALMA. *Plum. Gen.* 1. *Raii. Meth. Plant.* 135. The Palm Tree.

The Characters are,

It hath male and female Flowers; in some Species on the same Plant, and in others on different Plants; the Empalement of the male Flowers is divided into 3 Parts. The Flowers have 3 Petals, and 6 Stamina terminated by oblong Summits, with an obsolete Germen, supporting 3 short Styles, crowned by acute Stigmas; these are barren. The female Flowers have a common Sheath, but no Empalement; they have 6 short Petals, and an oval Germen sitting upon an Awl-shaped Style, crowned by a trifid Stigma. The Germen becomes a Fruit of various Forms and Sizes in different Species.

The Species are,

1. **PALMA frondibus pinnatis, foliis angustioribus aculeis terminalibus.** Palm Tree with winged Leaves, and narrow Lobes terminated by Spines. This is the *Palma major. C. B. P.* 506. The greater Palm or Date Tree.

2. **PALMA frondibus pinnatis, foliis replicatis, spadiceis alaribus, fructu maximo anguloso.** Palm Tree with winged Leaves whose Lobes are folded back, Foot Stalks proceeding from the Sides of the Branches, and a large angular Fruit. This is the *Palma Indica, coccofera, angulosa. C. B. P.* 502. Indian Palm Tree having an angular Fruit, commonly called *Cocoa Nut*.

3. **PALMA frondibus pinnatis, ubique aculeatis, aculeis nigricantibus fructu majore.** Palm Tree with winged Leaves, every where armed with black Spines, and bearing a larger Fruit. This is the *Palma tota spinosa major, fructu pruniformi. Sloan. Cat. Fam.* 177. Greater Palm Tree all over prickly, with a Plum-shaped Fruit, commonly called great *Macaw Tree*.

4. **PALMA frondibus pinnatis, foliis replicatis, ramis aculeatis, aculeis saepius geminatis nigricantibus.** Palm Tree with winged Leaves, whose Lobes are folded back, and prickly Branches, whose Thorns often come by Pairs, and are black.

5. **PALMA frondibus pinnatis, caudice aequali, fructu minore.** Palm Tree with winged Leaves, an equal Trunk, and a smaller Fruit. This is the *Palma altissima non spinosa, fructu pruniformi minore recemoso sparso. Sloan. Cat. Fam.* 176. Tallest Palm Tree without Spines, and a smaller Plum-shaped Fruit, growing in long Bunches scatteringly, commonly called *Cabbage Tree*.

6. **PALMA frondibus pinnatis, caudice tereti aculeato, fructu minore.** Palm Tree with winged Leaves, a taper prickly Stalk, and a smaller Fruit. This is the *Palma spinosa minor, caudice gracili, fructu pruniformi, minimo rubro. Sloan. Cat. Fam.* 178. Smaller prickly Palm Tree with a slender Stalk, and the least, red, Plum-shaped Fruit, called prickly Pole.

7. **PALMA frondibus pinnatis, foliis linearibus planis, stipitibus spinosis.** Palm Tree with winged Leaves, hav-

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ing narrow plain Lobes, and prickly Mid-ribs. This is the *Palma foliorum pediculis spinosis, fructu pruniformi luteo oleoso*. Sloan. Cat. Jam. 175. Palm Tree with prickly Foot Stalks to the Leaves, and a yellow, Plum-shaped, oily Fruit, commonly called oily Palm Tree.

8. *PALMA frondibus pinnato-palmatis plicatis, caudice squamato*. Palm Tree with Hand-shaped winged Leaves which are plaited, and a scaly Stalk. *Palma Brasiliensis prunifera, a. folio plicatili seu flabelliformi, caudice squamato*. Raii. Hist. 1368. Plum-bearing Palm Tree of the Brasils with a plaited or Fan-shaped Leaf and a scaly Stalk, called Palmetto or Thatch.

9. *PALMA frondibus pinnatis, foliolis linearilanceolatis, petiolis spinosis*. Hort. Cliff. 482. Palm Tree with winged Leaves, whose Lobes are linearly Spear-shaped, and prickly Foot Stalks. This is the *Palma Japonica, spinosis pediculis, polypodii folio*. Boerb. Ind. alt. 2. 170. Palm Tree of Japan with prickly Foot Stalks, and a Polypody Leaf.

10. *PALMA frondibus pinnatis, foliolis rigidis, alternis, aculeis terminalibus*. Palm Tree with winged Branches, Lobes rigid, alternate, and terminated by Prickles.

11. *PALMA frondibus pinnato-palmatis, foliolis replicatis, inferne incurvis*. Palm Tree with Hand-shaped winged Leaves, whose Lobes are folded backward, and are hoary on their under Side.

12. *PALMA fructu clavato polypirena*. Trew. Dec. Tab. 26. Palm Tree with a Club-shaped Fruit containing many Seeds. This is the *Palma Americana foliis polygonatis brevioribus, leviter serratis, & nonnihil spinosis, trunco crasso*. Pluk. Phyt. American Palm Tree with shorter Solomon's Seal Leaves which are lightly sawed, and somewhat prickly, with a thick Trunk.

13. *PALMA frondibus pinnatis, foliolis lanceolatis plicatis geminatis sparsis*. Palm Tree with winged Leaves, whose Lobes are Spear-shaped, plaited, and come out by Pairs from one Point, standing thinly along the Mid-rib. This is the *Palma altissima, non spinosa, fructu oblongo*. Houst. Mss. Tallest Palm Tree having no Prickles, and bearing an oblong Fruit.

14. *PALMA foliis simplicibus integerrimis flaccidis*. Palm Tree with single, entire, flaccid Leaves. This is the *Palm aprunifera foliis Yuccæ, fructu in racemis congestis cerasi formi, duro, cinereo, pisi magnitudine, cujus lacryma sanguis draconis est dicto*. Com. Cat. Plumbearing Palm Tree, with Leaves like the Yucca, and Fruit gathered in long Bunches, Cherry-shaped, Ash-coloured, hard, and the Size of Peas, whose Tears are called Dragons Blood, commonly called Dragon Tree.

The 1st Sort here mentioned is the common Date Tree, which grows plentifully in *Africa*, and some of the eastern Countries, from whence the Fruit is brought to *England*. This rises to a great Height in warm Countries; the Stalks are generally full of rugged Knots, which are the Vestiges of the decayed Leaves, for the Trunks of these are not solid like other Trees, but the Center is filled with Pith, round which is a tough Bark full of strong Fibres while young, but as the Trees grow old, this Bark hardens and becomes ligneous; to this Bark the Leaves are closely joined, which in the Center rise erect, being closely folded or plaited together, but after they are advanced above the Vagina which surrounds them, they expand very wide on every Side the Stem,

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and, as the older Leaves decay, the Stalk advances in Height. The Leaves of these Trees, when grown to a Size for bearing Fruit, are 6 or 8 Feet long, and may be termed Branches; (for the Trees have no other) these have narrow long Leaves (or Pinnæ) set on alternately their whole Length. The small Leaves or Lobes are toward the Base 3 Feet long, and little more than one Inch broad; they are closely folded together when they first appear, and are wrapped round by brown Fibres or Threads, which fall off as the Leaves advance, making Way for them to expand; these never open flat, but are hollow like the Keel of a Boat, with a sharp Ridge on their Backside; they are very stiff, and, when young, of a bright green, ending with a sharp black Spine. These Trees have male Flowers on different Plants from those which produce the Fruit, and there is a Necessity for some of the male Trees to grow near the female to render them fruitful; or, at least, to impregnate the Ovary of the Seed, without which the Stones, taken out of the Fruit, will not grow. Most of the old Authors, who have mentioned these Trees, affirm, that unless the female or Fruit-bearing Palm Trees have the Assistance of the male, they are barren; therefore in such Places, where there are no male Trees near the female, the Inhabitants cut off the Bunches of male Flowers when they are just opened, and carry them to the female Trees, placing them on the Branches near the female Flowers to impregnate them; which, they all agree, has the desired Effect, rendering the Trees fruitful, which would otherwise have been barren. *Pere Labat* in his Account of *America* mentions a single Tree of this Kind, growing near a Convent in the Island of *Martinica*, which produced a great Quantity of Fruit, which came to Maturity enough for eating; but, as there was no other Tree of this Kind in the Island, they were desirous to propagate it, and accordingly planted great Numbers of the Stones for several Years, but not one of them grew; therefore after having made several Trials without Success, they were obliged to send to *Africa*, where these Plants grew in Plenty, for some of the Fruit; the Stones of which they planted, and raised many Plants. He then conjectures, that the single Tree, before mentioned, might be probably so far impregnated by some neighbouring Palm Trees of other Species, as to render it capable of ripening the Fruit, but not sufficient to make the Seeds prolific, as is the Case when Animals of different Kinds copulate.

The Flowers of both Sexes come out in very long Bunches from the Trunk between the Leaves, and are covered with a Sheath which opens and withers; those of the male have 6 short Stamina with narrow four-cornered Summits filled with Farina. The female Flowers have no Stamina, but have a roundish Germen, which becomes an oval Berry, with a thick Pulp inclosing a hard oblong Stone with a deep Furrow running longitudinally. The Bunches of the Fruit are sometimes very large.

This Species of Palm is by *Dr. Linnaeus* titled *Phoenix*, which is the *Greek* Name of it, and he makes it a distinct Genus.

These Plants may be easily produced from the Seeds taken out of the Fruit, (provided they are fresh) which should be sown in Pots filled with light rich Earth, and plunged

plunged into a moderate hot Bed of Tanners Bark, which should be kept in a moderate Temperature of Heat, and the Earth frequently refreshed with Water.

When the Plants come up, they should be each planted in a small Pot filled with the same light rich Earth, and plunged into a hot Bed again, observing to refresh them with Water, also to let them have Air in Proportion to the Warmth of the Season, and the Bed in which they are placed. During the Summer they should remain in the same hot Bed, but in [the Beginning of August] let them have a great Share of Air to harden them against the Approach of Winter; for if they are too much forced, they will be so tender as not to be preserved through the Winter without much Difficulty especially if you have not the Conveniency of a Bark Stove to keep them in.

The Beginning of October remove the Plants into the Stove, placing them where they may have a moderate Share of Heat (these being somewhat tenderer, while young, than after they have acquired some Strength); though indeed they may be sometimes preserved alive in a cooler Situation, yet their Progress would be so much retarded, as not to recover their Vigour the succeeding Summer. Nor is it worth the Trouble of raising these Plants from Seeds, without the Conveniency of a Stove to forward their Growth; for where this is wanting, they will not grow to any tolerable Size in 20 Years.

Whenever these Plants are removed, (which should be done once a Year) be very careful not to cut or injure their large Roots, which is very hurtful to them; but clear off all the small Fibres which are inclinable to Mouldiness; for if these are left on, they will in Time decay, and hinder the fresh Fibres from coming out, which will greatly retard the Growth of the Plants.

The Soil, in which these Plants should be placed, must be composed in the following Manner, viz. Half of light fresh Earth taken from a Pasture Ground, the other Half Sea Sand, and rotten Dung or Tanners Bark in equal Proportion; these should be carefully mixed, and laid in a Heap 3 or 4 Months at least before it is used, but should be often turned over, to prevent the Growth of Weeds, and to sweeten the Earth. Also observe to allow them Pots proportionable to the Sizes of the Plants; but never let them be too large, which is of worse Consequence than if they are too small. During the Summer Season they should be frequently refreshed with Water; but be careful not to give it in too great Quantities, and in Winter they must be now and then refreshed, if they are placed in a warm Stove; otherwise they require very little Water at that Season.

These Plants are very slow Growers, in their native Countries, notwithstanding they arrive to a great Magnitude; for it has often been observed by several of the old Inhabitants of those Countries that the Plants of some of these Kinds have not advanced 2 Feet in Height in 10 Years; so that when they are brought into these Countries, it cannot be expected they should advance very fast, especially where there is not due Care taken to preserve them warm in Winter; but however slow of Growth these are in their native Countries yet they may be with us greatly forwarded, by placing the Pots in a hot Bed of Tanners Bark, which should be renewed as

often as is necessary, and the Plants always preserved therein both Winter and Summer, observing to shift them into larger Pots as they advance in Growth, also to supply them with Water properly: In which Management I have had several of them come on very fast; for I observe the Roots of these Plants are very apt to root into the Bark, if their Pots remain a considerable Time without shifting, where they meet with a gentle Warmth, and the Moisture arising from the Fermentation of the Bark doth preserve their Fibres plump and vigorous; but although the Leaves grow tall in a few Years with this Management, yet it is long before the Plants come to have any Stems. There are Plants now in the Chelsea Garden, whose Leaves are 7 Feet long, which were raised from Seeds more than 20 Years ago, and their Stems are not 2 Feet high; one of which has produced some small Bunches of male Flowers.

The 2d Sort, here mentioned, is the Cocoa Nut, whose Fruit are frequently brought to England; some of which are of a large Size. The Branches of this Tree are winged like those of the former, but the small Leaves or Lobes are 3 Times as broad; they open flat, their Borders fold backward, and are of a lighter green than those of the 1st Sort. The whole Leaf (or Branch) is often 12 or 14 Feet long; the male Flowers grow in different Parts of the same Tree with the Fruit, proceeding from the Trunk between the Leaves; they are disposed in long Bunches, as are also the female, the Nuts growing in very large Clusters, which are covered with a thick fibrous Coat adhering closely to them. The Nuts are large, oval, and have 3 Holes in the Shell at the Top; the Kernel is firm, white within, and the Shell contains a Quantity of pale Juice, called the Milk.

The Cocoa Nut is cultivated in most of the inhabited Parts of the East and West-Indies, but is supposed a Native of the Maldives, and the desert Islands of the East-Indies, from whence it is supposed to have been transported to the warm Parts of America; for it is not found in any of the inland Parts, nor any where far distant from Settlements. It is one of the most useful Trees to the Inhabitants of America, who have many of the common Necessaries of Life from it. The Bark of the Nut is made into Cordage, the Shell of the Nut into drinking Bowls, the Kernel affords them a wholesome Food, and the Milk contained in the Shell, a cooling Liquor. The Leaves of the Trees are used for thatching their Houses, and are wrought into Baskets, and most other Things which are made of Osiers in Europe.

This Tree is propagated by planting the Nuts, which in 6 Weeks or 2 Months after planting will come up, provided they are fresh, and thoroughly ripe, which few of them are, when brought to England; for they always gather them before they are ripe, that they may keep during their Passage so the best Way to bring Nuts into England for planting, would be to take such of them as are fully ripe, and put them up in dry Sand in a Tub, where the Vermin may not get at them; and these will often sprout in their Passage, which will be an Advantage, because then they may be immediately planted into Pots of Earth, and plunged in the Bark Bed.

These Plants in the hot Islands of America make considerable Progress in their Growth, and arrive to a very great

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nitude; but in *Europe* it is of much slower Growth, being many Years before it advances to any considerable Height; but as the young Leaves of these Plants are pretty large, they make a good Appearance amongst other tender exotick Plants, in 2 or 3 Years time. This Plant is preserved in curious Gardens in *England*, for Variety, where it must be placed in the Bark Stove, and managed as hath been directed for the other Kind of Palm; observing, as often as they are transplanted, not to cut their strong Roots, which is generally Death to most of the Palm Kind. These Plants must not be too much confined in their Roots, for if they are, they will make but little Progress; therefore, when the young Plants have filled the Pots with their Roots, they should be shifted into Tubs of a moderate Size, that their Roots may have Room to extend; but these Tubs must be kept constantly plunged into the Bark Bed, otherwise the Plants will not thrive. The Method of raising them from the Nuts, when they are planted before they have sprouted, is fully described under the Article of raising exotick Seeds; to which the Reader is desired to turn to avoid Repetition.

The 3d Sort is commonly called Macaw Tree by the Inhabitants of the *British* Islands in *America*; this rises to the Height of 30 or 40 Feet. The Stem is generally larger toward the Top than at Bottom; the Branches (or rather the Leaves) are winged; the small Leaves or Lobes are long and broad; the Stalk and Leaves are strongly armed with black Spines of various Sizes in every Part; the male and female Flowers are on the same Tree, coming out in the same Manner as the Cocoa Nut. The Fruit is about the Size of a middling Apple, and is inclosed in a hard Shell.

The Macaw Tree is very common in the *Carribee* Islands, where the Negroes pierce the tender Fruit, from whence flows out a pleasant Liquor, of which they are very fond; the Body of the Tree affords a solid Timber, with which they make Javelins, Arrows, &c. and is by some supposed to be a Sort of Ebony. This Tree grows very slow, and requires to be kept warm in Winter.

The 4th Sort grows naturally at *La Vera Cruz* from whence the late Dr. *Houssoun* sent it to *England*; this hath winged Leaves or Branches like the other Sorts. The small Leaves or Lobes are as narrow as those of the first Sort, but are not quite so stiff; they spread open, are flat, and their Edges fold backward; their Ends are blunt, and have no Spines; the Mid-rib is armed with long black Spines, which frequently come out by Pairs from the same Point. The Flowers come out from between the Leaves, and the Fruit grows on the same Plant as the male Flowers, which are about the same Size and Shape as those of the former Sort; but, as the Lobes of the Leaves are much narrower, and have no Spines on their Surface, there can be no Doubt of its being a distinct Species.

The 5th Sort is commonly called Cabbage Tree in the *West-Indies*; where it rises to a very great Height. *Ligon* in his History of *Barbadoes* says, there were then some of these growing there, which were more than 200 Feet high, and that he was informed they were a hundred Years growing to Maturity, so as to produce Seeds. The Stalks of these Trees are seldom larger than a Man's Thigh; they are smother than those of most

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other Sorts, for the Leaves naturally fall off entire from them, and only leave the Vestigia or Marks where they have grown. These Leaves (or Branches) are 12 or 14 Feet long; the small Leaves or Lobes are about a Foot long, and half an Inch broad, with several longitudinal Plaits or Furrows ending in soft acute Points; these are not so stiff as those of the first Sort, and are placed alternately. The Flowers come out in long loose Bunches below the Leaves; these branch out into many loose Strings, and are near 4 Feet long, upon which the Flowers are thinly placed. The female Flowers are succeeded by Fruit about the Size of a Hazel Nut, having a yellowish Skin, sitting close to the Strings of the principal Foot Stalk.

As the inner Leaves of this encompass the future Buds more than most of the other Species, it is distinguished by the Appellation of Cabbage Tree; for the Center Shoots, before they are exposed to the Air, are white and very tender, like most other Plants which are blanched; and this is the Part which is cut out and eaten by the Inhabitants, and is frequently pickled and sent to *England* by the Title of Cabbage; but whenever these Shoots are cut out, the Plants decay, and never after thrive so that few of the Trees are now to be found in any of the Islands near Settlements, and those are left for Ornament.

The 6th Sort is commonly called *Prickly Pole* in *Jamaica*, where it naturally grows. These Trees are commonly found in Thickets, where a great Number of them are close together. Their Stalks are slender, seldom more than 5 or 6 Inches Diameter, but rise to the Height of forty Feet, and are closely armed with long Thorns. The Leaves are placed circularly on the Top, (as in most of the Species.) These are winged, but the Lobes are shorter and greener than those of the other Sorts, and are closely armed with Thorns. The Flowers come out as those of the Cocoa Nut on long branching Foot Stalks; they are larger than the largest grey Peas, flatted at the Top, and are covered with a red Skin. The Inhabitants of *Jamaica* make Rammers, and Rods for scowering Guns, of the Stems of these Trees, which are very tough and pliable; but no Use is made of any other Part, so far as I can learn.

The 7th Sort is called in the *West-Indies* the Oily Palm, and by some Negroes Oil, for the Fruit of this Tree was first carried from *Africa* to *America* by the Negroes. It grows in great Plenty on the Coast of *Guinea*, and in the *Cape de Verd* Islands, but was not in any of our *American* Colonies till it was carried there; but now the Trees are in Plenty in most of the Islands where the Negroes are careful to propagate them.

The Branches, (or rather the Leaves) of this Tree, are winged; the small Leaves or Lobes, are long, narrow, and not so stiff as most of the other Sorts; the Foot Stalks of their Leaves are broad at their Base, where they embrace the Stem, diminishing gradually upward, and are armed with strong, blunt, yellowish Thorns, which are largest at their Base. The Flowers come out at the Top of the Stem between the Leaves; some Bunches have only male Flowers, others have female the latter are succeeded by oval Berries, bigger than those of the largest *Spanish* Olives, but of the same Shape; these grow in very large Bunches, and when ripe are of a yellowish Colour.

From the Fruit the Inhabitants draw an Oil, the same Way

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Way as it is drawn from Olives; from the Body of the Tree they extract a Liquor which, when fermented, has a vinous Quality, and will inebriate. The Leaves are wrought into Mats by the Negroes to lie on.

The 8th Sort is called *Palmetto Tree*, or Thatch, by the Inhabitants of *Jamaica*, where it grows on all the Honey Comb Rocks in great Plenty. It rises with a slender Stalk 10 or 12 Feet high, naked and smooth, and at the Top garnished with many Fan-shaped Leaves placed circularly; these have Foot Stalks 2 or 3 Feet long, armed with a few strong, green, crooked Spines; the Pinnæ, or Lobes all meet in one Center, where they join the Foot Stalk, and are joined together a third Part of their Length from their Base; they are at first closely folded into Plaits, but afterward spread out like a Fan; their Ends being pliant often hang downward, and between these Pinnæ hang down long Threads. The Flowers and Fruit come out from between the Leaves; the Fruit is of the Shape and Size of the small *Lucca* Olives. The Leaves of this Tree are used for Thatch all over the *West-Indies*.

The 9th Sort grows naturally in *Japan*, also on rocky, dry Mountains at *Malabar*. This rises with a strait Trunk about 40 Feet high, with many Circles round it the whole Length, occasioned by the Vestigia of the Leaves, which are placed circularly round the Stem; so as these separate entirely and fall off, the Circles remain where their Base embraced the Stalk. The Stalks are terminated by an obtuse Cone, just below which the Leaves are placed; these on the large Trees are 8 or 9 Feet long, but those of the small Plants are much less; the largest I have seen were not more than 2 Feet long. The Base of the Foot Stalk, which partly embraces the Trunk, is broad and three cornered, armed on each Side with short Spines to the Place where the Lobes, or small Leaves, begin. These Pinnæ or Lobes, are long, narrow, and entire, of a lucid green on their upper Side, standing by Pairs opposite along the Mid-rib very close together. The Flowers and Fruit are produced in large Bunches at the Foot Stalks of the Leaves; the Fruit is oval, about the Size of a large Plumb, and nearly of the same Shape; the Skin, or Covering, changes first yellow, and afterward red when ripe; of a sweet Taste, under which is a hard brown Shell, inclosing a white Nut in Taste like the Chestnut.

From the Pith of the Trunk of this Tree is made the Sago; this is first pulverized, then it is made into a Paste, and afterward granulated.

The 10th Sort grows naturally at *St. Helena*, from whence the Plants were brought to *England*. The Leaves of this, on Plants now in *England* are 10 Feet long; the Mid-rib, or Foot Stalk, is broad and flat on the under Side, but rises with a sharp Ridge on the upper; the small Leaves, or Lobes, are ranged alternately on the Sides, which are also broad; these are from 2 Feet and a Half to 9 or 10 Inches long, the longest being at Bottom, decreasing gradually to the Top; they are stiff, and fold inward, of a dark green ending in a sharp Thorn. One of these Plants has the two last Years produced Bunches of male Flowers between the Leaves; but we are at present ignorant what the Fruit is which they produce, but as the Leaves are very different from all

the Sorts of Palms here known, I make no Doubt of its being a distinct Species.

The 11th Sort was discovered by Mr. R. Millar, growing naturally on the Mountains near *Panama*, where the *Spaniards* call it Mountain Cabbage. The Fruit of this Tree, which was sent to *England* by the Gentleman before mentioned, were of the Size and Shape of middling Plumbs, covered with a thick Shell; from these several Plants were raised in the *English* Gardens, which have made no great Progress as yet. The Leaves stand upon pretty long Foot Stalks, broad at the Top, and have a sharp Ridge or Angle underneath. The Lobes, are placed circularly, meeting in a Point at their Base, where they join the Foot Stalk; they are divided to the Bottom, and are 2 Feet long, 3 Inches broad in the Middle, and fold backward; they are of a deep green on their upper Side, and of a russet Colour on their under Side at first, but afterward become white. These are not so stiff as those of most other Sorts, nor do they end in Spines.

The 12 Sort was discovered by Dr. *Houfoun*, growing naturally in the Sands near *Old Vera Cruz* in *America*. This hath a thick Stem, which seldom rises more than 2 Feet high. The leaves come out round the upper Part of the Stem, standing on Foot Stalks a Foot and a Half long; they are winged; the Lobes or small Leaves, are about 5 Inches long, and one and a Half broad in the Middle, drawing to a Point at both Ends; they are stiff, smooth and entire, having a few small Indentures at their Points, and are placed alternate, of a pale green Colour; there are 14 or 15 of these Lobes ranged along the Mid-rib, or Stalk. The Fruit rises up from the Side of the Stem, upon a short thick Foot Stalk, standing upright, and shaped like a Club, having many red Seeds about the Size of large Peas, standing in separate Cells round the central Foot Stalk, to which they adhere. These Plants have their male Flowers on separate Plants from the Fruit, for all those Plants which have flowered in *England* are of the male Kind. These Plants loose the Leaves before the Fruit is ripe annually. The first Time Dr. *Houfoun* saw these Plants at *La Vera Cruz*, they were in full Leaf, but on his Return to the same Place 3 Months after, the Fruit was then ripe, and all the Leaves were fallen off; this he afterwards observed the following Season.

The 13th Sort was also discovered by Dr. *Houfoun* in the *Spanish West-Indies*. This rises with a very tall naked Trunk garnished at Top with long winged Branches or Leaves, whose Lobes are Spear-shaped and plaited; they are of a softer Texture than any of the other Sorts, and for the most Part come out two from the same Point, so stand by Pairs on the same Side of the Mid rib; they have two Lobes on a Side a little above each other, but there is a great Space between every 4 Lobes. The Flowers come out in long Bunches from between the Leaves, the male Flowers hanging on long slender Strings; but the Fruit, about the Size of a middling Plum, is collected into large Bunches.

The 14 Sort grows naturally in the *Cape Verd* Islands, from whence I had one of the Plants sent me; also in the *Medeira*, from whence I received the Seeds. This is called a Dragon Tree, because the inspissated

Juice of the Plants becomes a red Powder very like the eastern Dragons Blood, and is frequently used instead of it in the Shops; but the Tree, from whence the true Dragons Blood is taken, is of a very different Genus from this. Dr. Van Royen in the *Prodromus* of the *Leyden* Garden has ranged this among the Yuccas, I suppose, from the Similitude of the Plant to those of that Genus, but, as the Fruit of this is a Berry not unlike that of the Bay Tree, and the Seeds of the Yucca grow in Capsules with 3 Cells, they cannot be of the same Genus; nor have we any Account of the real Characters of this Plant, so as absolutely to determine the Genus; therefore, as it has by several modern Authors been ranged under this Title, I have continued it there. This rises with a thick Trunk nearly equal in Size the whole Length, the inner Part of which is pithy; next to this is a Circle of strong Fibres, and the Outside is soft. The Stalk or Trunk rises 12 or 14 Feet high, and is nearly of the same Diameter the whole Length, which is rarely more than 6 Inches; there are the circular Marks or Rings left the whole Length, where the Leaves are fallen off; for as these half embrace the Stalk with their Base, so when they fall away, the Vestigia where they grew remain. The Top of the Stalk sustains a large Head of Leaves, which come out singly all round it; they are shaped like those of the common Iris, but are often 4 or 5 Feet long, and an Inch and a Half broad at their Base, where they embrace the Stalk, and lessen gradually to the End, where they terminate in a Point. These Leaves are pliable, and hang down all round the Stem; they are entire and of a deep green, smooth on both Surfaces, and greatly resemble those of the common yellow Iris. As this has not flowered in *England*, I can give no Account of its Flowers, but so far as I can judge from the Berries which I have received, it may properly enough be ranged in this Genus.

All the Sorts of Palms are propagated by Seeds, which should be sown as hath been directed for the first Sort, and the Plants should afterward be treated in the same Manner, with this Difference, that such of them as are Natives of very warm Countries, will require to be kept in a warmer Air. The 2d, 3d, 4th, 5th, 7th, 8th, 12th, and 13th Sorts should be constantly kept in the Bark Bed in the Stove, otherwise they will not make great Progress in *England*; and when they do thrive, they grow in about 20 Years too tall for most of the Stoves at present built here, nor can we hope to see many of them produce Fruit in *England*; the Plants are preserved by the curious for their Foliage, which being so singular and different from that of the *European* Trees, renders them worthy of Care.

The other Sorts may be kept in a dry Stove in Winter in a moderate Temperature of Air, and in the Heat of Summer may be exposed to the open Air in a warm sheltered Situation for about 3 Months; but they should be removed into the Stove, before the Morning Frosts come on in Autumn. When these Plants are kept in a moderate Degree of Warmth, they should have but little Water during the Winter Season; and in Summer, when they are exposed to the open Air, they must not be often watered, unless the Season is remarkably dry and warm, for too much Moisture will

soon destroy them. The other Management of them is nearly the same as for the Date Palms, which is not to cut their principal Roots when they are shifted, nor to confine their Roots too much; but as the Plants grow in Size, they should annually be removed into Pots a Size larger than those they were in the former Year. The Earth, in which they are planted, should be light, to let the Moisture easily pass off; for if it is strong, and detains it; the tender Fibres of the Roots will rot.

PANAX. Lin. Gen. Plant. 1031. Panacea. Mitch. Gen. 26. *Araliastrum*. Vaill. 6. Ginseng or Ninseng.

The Characters are,

It hath male and hermaphrodite Flowers on distinct Plants; the male have simple globular Umbels, composed of several coloured Rays which are equal. The Involucrum on the Outside consists of the same Number of small Spear-shaped Leaves. The Flower has 5 narrow oblong, blunt Petals, reflexed, sitting on the Empalement, and 5 oblong slender Stamina inserted in the Empalement, terminated by single Summits. The hermaphrodite Umbels are simple, equal, and clustered; the Involucrum is small, permanent, and composed of several Awl-shaped Leaves; the Empalement is small and permanent. The Flowers have 5 oblong equal Petals, recurved, and 5 short Stamina terminated by single Summits which fall off, with a roundish Germen under the Empalement supporting 2 small erect Styles, crowned by simple Stigmas. The Germen becomes an umbilicated Berry with 2 Cells, each containing a single, Heart-shaped, convex, plain Seed.

The Species are,

1. PANAX foliis ternis quinatis. Flor. Virg. 147. Panax with trifoliate cinquefoil Leaves. This is the *Araliastrum quinquefolii folio, majus, Ninsin vocatum*. D. Sarrafin. Vaill. Gen. 43. Greater five-leaved Bastard Aralia, called Ninsin.

2. PANAX foliis ternis ternatis. Flor. Virg. 35. Panax with three trifoliate Leaves. This is the *Araliastrum fragariae folio minus*. Vaill. Gen. 43. Smaller Bastard Aralia with a Strawberry Leaf.

Both these Plants grow naturally in North America; the first is generally believed to be the same as the Tartarian Ginseng, the Figures and Descriptions of that Plant, which have been sent to Europe by the Missionaries, agreeing perfectly with the American Plant.

This hath a fleshy taper Root as large as a Man's Finger, which is jointed and frequently divided into 2 smaller Fibres downward. The Stalk rises near a Foot high naked to the Top, where it generally divides into 3 smaller Foot Stalks, each sustaining a Leaf composed of 5 Spear-shaped Lobes sawed on their Edges; they are of a pale green, and a little hairy. The Flowers arise on a slender Foot Stalk, just at the Division of the Foot Stalks, which sustain the Leaves, and are formed into a small Umbel at the Top; they are of an herbaceous yellow Colour, composed of 5 small recurved Petals. These appear the Beginning of June, and are succeeded by compressed Heart-shaped Berries, which are first green, but afterward turn red, inclosing 2 hard, compressed, Heart-Shaped Seeds, which ripen the Beginning of August.

The Chinese hold this Plant in great Esteem, according to the Accounts which have been transmitted to Europe by the Missionaries. Father Jartoux in his Letters

ters says, that the most eminent Physicians in China have written whole Volumes on the Virtues of this Plant, and make it an Ingredient in almost all Remedies, which they give to their Nobility; for it is of too high Price for the common People. They affirm that it is a sovereign Remedy for all Weakness occasioned by excessive Fatigues either of Body or Mind; that it cures Weakness of the Lungs, and the Pleurisy; it stops Vomiting; it strengthens the Stomach, and helps the Appetite; that it strengthens the vital Spirits, and increases Lymph in the Blood; in short, that it is good against Dizziness of the Head, Dimness of Sight, and that it prolongs Life in old Age.

This Father also says, he has made Trial of the Root of this Plant himself, and in an Hour after taking half of one of the Roots, found himself greatly recovered from Weariness and Fatigue, much more vigorous, and could bear Labour with greater Ease than before.

He likewise mentions the Emperor's having employed ten thousand Tartars in the Year 1709, to gather this Plant in the Deserts, where it naturally grows; these were attended by a Guard of Mandarines, who encamp with their Tents in such Places as are proper for the Subsistence of their Horses, and from Time to Time send their Orders to the respective Troops under their Care; and when they have completed their Collection of Roots, they return with their Cargo to the City. The Roots of this Plant which have been gathered in America and brought to England, have been sent to China, where, at the Beginning, there was a good Market for them; but the Quantities which were afterward sent, did not answer so well, the Market being overstocked with that Commodity.

This Plant has been introduced to the English Gardens from America, and where it has been planted in a shady Situation and a light Soil, the Plants have thriven and produced Flowers, and ripened their Seeds annually, but not one of these Seeds have grown; for I have several Years sown them soon after they were ripe, without any Success; I have also sown of the Seeds which were sent me from America several Times, in various Situations, and have not raised a single Plant from either; and by the Accounts which the Missionaries have sent from China, it appears, they have had no better Success with the Seeds of this Plant, which they say they have frequently sown in the Gardens in China, but could not raise one Plant; so that I believe there is a Necessity for the hermaphrodite Plants to have some male Plants stand near them, to render the Seeds prolific; for all those I have seen, or saved the Seeds from, were such as had hermaphrodite Flowers; and though the Seeds seemed to ripen perfectly, yet their not growing, though I have waited 3 Years without disturbing the Ground, confirms me in this Opinion.

The 2d Sort grows naturally in the same Countries, but whether it is possessed of the same Qualities as the first I cannot say; I have seen but one Plant of this Sort in England, which was sent me from Maryland, and did not live over the first Summer, which was remarkably dry, and being planted in a dry Soil, was the cause of its Death; the Stalk of this was single, and did not rise more than 4 Inches high, dividing into 3 Foot Stalks, each sustaining a trifoliate Leaf, whose Lobes were long-

er, narrower, and deeper indented on the Edges, than those of the first. The Flower Stalk rose from the Divisions of the Foot Stalk of the Leaves, but before the Flowers opened, the Plant decayed.

PANCRATIUM. Dill. Hort. Elth. 221. Lin. Gen. Pl. 365. Narcissus. Tourn. Inst. 353. Sea Daffodil.

The Characters are,

The Flowers are inclosed in an oblong Spatha or Sheath, which tears open on the Side and withers. The Flowers have a Funnel-shaped, cylindrical Nectarium of one Leaf, spreading open at the Top, and 6 Spear-shaped Petals, inserted on the Outside of the Nectarium above its Base, with 6 long Stamina inserted in the Brim of the Nectarium, terminated by oblong prestrate Summits. They have a three cornered obtuse Germen situated under the Flower, supporting a long slender Style, crowned by an obtuse Stigma. The Germen afterward becomes a roundish three cornered Capsule with 3 Cells, filled with globular Seeds.

The Species are,

1. PANCRATIUM *spatha multiflora, petalis planis, foliis lingulatis*. Lin. Sp. Plant. 291. Pancratium with a Sheath containing many Flowers, plain Petals, and Tongue-shaped Leaves. This is the *Narcissus maritimus*. C. B. P. 540. The Sea Daffodil.
2. PANCRATIUM *spatha multiflora, foliis ensiformibus, flaminibus nectario longioribus*. Fler. Leyd. Prod. 34. Pancratium with many Flowers in a Sheath, sword-shaped Leaves, and Stamina longer than the Nectarium. This is the *Narcissus Ilyricus liliaceus*. C. B. P. 55. Lilly Daffodil of Sclavonia. Also *Narcissus tertius matthioli*.
3. PANCRATIUM *spatha uniflora, petalis reflexis*. Fler. Zeyl. 126. Pancratium with one Flower in a Sheath, whose Petals are reflexed. This is the *Narcissus Zeylanicus, flore albo hexagono odorato*. H. L. 691. Daffodil of Ceylon, with a white hexagonal sweet Flower.
4. PANCRATIUM *spatha biflora*. Hort. Cliff. 133. Pancratium with two Flowers in a Sheath. This is the *Pancratium Mexicanum, flore gemello candido*. Hort. Elth. 299. Mexican Pancratium, with two white Flowers.
5. PANCRATIUM *spatha multiflora, foliis ovatis nervosis*. Lin. Sp. Pl. 291. Pancratium with many Flowers in a Sheath, and oval veined Leaves. This is the *Narcissus Amboinensis, folio latissimo subrotundo*. Hort. Amst. *Narcissus* of Amboyna, with the broadest roundish Leaf.
6. PANCRATIUM *spatha multiflora, foliis linearibus, flaminibus nectarii longitudine*. Lin. Sp. Plant. 291. Pancratium with many Flowers in a Sheath, narrow Leaves, and Stamina the Length of the Nectarium. This is the *Lilio-Narcissus polyanthus, flore albo*. Catech. Car. 3. p. 5. The Lilly *Narcissus* bearing many white Flowers.
7. PANCRATIUM *spatha multiflora, foliis carinatis angustioribus*. Pancratium with many Flowers in a Sheath, and narrow Keel-shaped Leaves. This is the *Narcissus Americanus, flore multiplici, albo, odore balsami Peruviani*. Tourn. Inst. 358. American *Narcissus* with many white Flowers, smelling like Balsam of Peru.
8. PANCRATIUM *spatha multiflora, foliis carinatis latioribus*. Pancratium with many Flowers in a Sheath, and broader Keel-shaped Leaves. This is the *Narcissus totus albus, latifolius, polyanthus, major odoratus, flaminibus sex à tubi ampli margine extantibus*. Sloan. Cat. Jam. 115. Broad-leaved Daffodil, with many larger sweet

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Flowers which are very white, and a large Tube, out of whose Border proceed six Stamina.

9. *PANCRATIUM foliis ovatis, nervosis, spatula multiflora, flaminibus nectario longioribus.* *Pancratium* with oval veined Leaves, and many Flowers in a Sheath, whose Stamina are longer than the Nectarium. This is the *Pancratium foliis amplis ovatis acuminatis petiolatis, spatula multiflora, floribus minoribus candidis fragrantibus.* *Trev. Tab. 28.* *Pancratium* with large, oval, acute-pointed Leaves having Foot Stalks, and many Flowers in a Sheath, small, white, and sweet scented.

The 1st Sort grows naturally on the Sea Coast in *Spain*, and the South of *France*. This hath a large, coated, bulbous Root, of an oblong Form, covered with a dark Skin; the Leaves are shaped like a Tongue, they are more than a Foot long, and one Inch broad, of a deep green, 6 or 7 of them rising together from the same Root, encompassed at Bottom with a Vagina or Sheath; between these arises the Stalk, which is a Foot and a Half long, naked, sustaining at the Top 6 or 8 white Flowers, inclosed in a Sheath, which withers and opens on the Side, to make Way for the Flowers to come out. The Germen are situated close to the Top of the Stalk, from these arise the Tube of the Flowers, which are 3 Inches long; they are very narrow, swelling at the Top, where the Cup or Nectarium is situated, on the Outside of which is fastened the 6 Segments or Petals of the Flower; these are narrow, and extend a great Length beyond the Nectarium; from the Border of the Nectarium arise 6 long slender Stamina, terminated by oblong Summits which are prostrate, and in the Center arises a Style the Length of the Stamina, terminated by an obtuse Stigma. The Flowers of this do not appear in *England* till the latter End of *August*, so are not succeeded by Seeds here. The Leaves are green all the Winter, and decay in Spring, so the Roots should be transplanted in *June*, after the Leaves are decayed. This must be planted in a very warm Border, and screened from severe Frost, otherwise it will not live through the Winter in *England*.

The 2d Sort grows naturally in *Sclavonia*, and in *Sicily*; this hath a large, coated, bulbous Root, covered with a dark Skin, sending out many thick strong Fibres, which strike deep in the Ground; the Leaves are sword-shaped, a Foot and a Half long and 2 Inches broad, of a grayish Colour. The Stalks are thick, succulent, and rise near 2 Feet high, sustaining at the Top 6 or 7 white Flowers shaped like those of the first Sort, but the Tube is shorter and the Stamina much longer. This flowers in *June*, and frequently produces Seeds which ripen in *September*.

This Sort is hardy, and will live through the Winter in the full Ground, being never injured but in very severe Winters; and if, in such Seasons, the Surface of the Ground is covered with Tanners Bark, Coal Ashes, Straw, or Peas Hulls, there will be no Danger of the Roots suffering by Frost. It is propagated either by Offsets from the Roots, or from Seeds; the former is more expeditious, for the Offsets will flower very strong the second Year; whereas those raised from Seeds, seldom flower in less than five Years.

The Roots should not be removed oftener than every third Year, if they are expected to flower strong;

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the best Time to transplant them is the Beginning of *October*, soon after the Leaves decay; they should not be kept long out of the Ground, for as they do not lose their Fibres every Year, so if these are dried by long keeping out of the Ground, it greatly weakens the Roots. This loves a light sandy Soil, and sheltered Situation; the Roots should be planted a Foot asunder every Way, and 5 Inches deep in the Ground.

If the Plants are propagated by Seeds, they should be sown in Pots filled with light Earth soon after they are ripe; these Pots should be placed under a hot Bed Frame in Winter, to screen them from Frost, but the Glasses must be taken off every Day in mild Weather. The other Management being the same as for the *Narcissus*, I need not repeat it here, so shall only mention, that the young Roots will require a little Protection in Winter, till they have obtained Strength.

The 3d Sort grows naturally in *Ceylon*; this hath a large bulbous Root, the Leaves are long and narrow, of a grayish Colour, and pretty thick, standing upright; the Stalk rises between them a Foot and a Half high, naked, sustaining one Flower at the Top, whose Petals are reflexed backward; the Nectarium is large, and cut at the Brim into many acute Segments; the Stamina are long, and turn toward each other at their Points, in which it differs from the other Species. The Flower has a very agreeable Scent, but is of short Duration; this is very rare in the Gardens at present.

The 4th Sort grows naturally at *La Vera Cruz*, from whence Dr. *Huysen* brought some of the Roots. The Leaves of this Sort are about a Foot long and almost two Inches broad, having 3 longitudinal Furrows. The Stalk rises about a Foot high, then divides like a Fork into 2 small Foot Stalks, or rather Tubes, which are narrow, green, and at first are encompassed by a thin Sheath which withers and opens to give Way to the Flowers, which are white, and shaped like those of the other Species, but have no Scent.

The 5th Sort was some Years past in the *English* Gardens, but I believe is now lost here; it grows naturally at *Amboyna*. The Root is oblong, white, and sends out several thick fleshy Fibres, which strike downward; the Leaves stand on very long Foot Stalks, some of them are oval, and others Heart-shaped, about 5 Inches long, and almost as many broad, ending in Points, having many deep longitudinal Furrows; they are of a light green, and their Borders turn inward. The Stalk is thick, round, and succulent, rising near 2 Feet high, sustaining at the Top several white Flowers, shaped like the other Species, but the Petals are broader, the Tube shorter, and the Stamina not so long as the Petals. These have a thin Sheath, which splits open longitudinally, to make Way for the Flowers.

The 6 Sort grows naturally on moist boggy Soils in *Georgia*, where Mr. *Catesby* discovered it. This hath a roundish bulbous Root, covered with a light brown Skin, from which arise several narrow dark green Leaves, about a Foot long; between these come out a thick Stalk about 9 Inches high, sustaining 6 or 7 white Flowers, with very narrow Petals, having large Bell-shaped Nectariums or Cups, deeply indented on their Brims, the Stamina do not rise far above the Nectarium, and are terminated by yellow Summits.

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The 7th Sort grows naturally in the Islands of the *West-Indies*, where it is called white Lilly. This hath a large bulbous Root, a little flatted at Top, covered with a brown Skin; the Leaves are near a Foot and Half long, and little more than one Inch broad, of a dark green, and hollowed in the Middle like the Keel of a Boat. The Stalks rise near 2 Feet high, they are thick, succulent, and naked, sustaining at the Top 8 or 10 white Flowers, shaped like these of the first Sort, but of a purer white, and have a strong sweet Odour, like that of Balsam of *Peru*. The Stamina are very long, spreading out wide each Way; the Pointal is of the same Length, standing in the Middle of the Nectarium. These Flowers are of short Duration, seldom continuing longer in Beauty than 3 or 4 Days, and in very hot Weather not so long; when these fade, the Germen, which are situated at the Bottom of the Tubes, turn to so many oblong Bulbs, irregular in Form, and, when ripe, drop on the Ground, where they put out Fibres and become Plants.

These foreign Species are most, if not all of them, of the Bulb-bearing Kind; but the 2 first have Seed Vessels with 3 Cells, inclosing many roundish black Seeds, so that though they agree in the Characters of their Flowers, yet in this Particular they differ greatly.

The 8th Sort grows naturally in the *West-Indies*, where it is not distinguished from the former; but as I have frequently propagated both, by the Bulbs which succeed the Flowers, and have always found the Plants so raised continue their Difference, I make no Doubt of their being distinct Species. This differs from the former, in the Leaves being much longer and broader; for these are near 2 Feet long, more than 3 Inches broad, and hollowed like the Keel of a Boat. The Flowers are larger, the Petals longer, and the Scent is not so strong as the former, and the Roots slower in every Season of the Year.

The 9th Sort grows naturally in the *West-Indies*; this hath a large, roundish, bulbous Root, from which arise several oval Leaves about a Foot long, and 6 Inches broad in the Middle, drawing to a Point at both Ends; they are of a deep green, and have many longitudinal Furrows. The Stalk is thick, succulent, and naked; it rises a Foot and a Half high, sustaining at Top 6 or 8 white Flowers, of an agreeable sweet Scent, shaped like those of the 7th Sort, but smaller; the Petals are narrower, the Tubes shorter, and so are the Spathæ or Sheaths.

These 7 Sorts last mentioned are tender, so will not thrive in *England*, unless placed in a warm Stove. The best Way to have these Plants in Perfection, is, to plunge the Pots into the Bark Bed in the Stove, where they will thrive and flower exceeding well; for though they may be preserved in a dry Stove, yet those will not thrive so well, nor their Flowers be so strong, nor will they flower oftener than once a Year, whereas when they are in the Tan Bed, the same Roots will often flower 2 or 3 Times in a Year. I have had several of the Species in flower at all Seasons of the Year.

They are propagated by Offsets from the Roots, and by the Bulbs which succeed the Flowers; if the latter are planted in small Pots filled with light Earth from a Kitchen Garden, and plunged into a moderate hot Bed,

they will soon put out Roots and Leaves, and with proper Management, become blowing Roots in one Year, so may be easily propagated; and if they are constantly kept in the Tan Bed in the Stove, they will put out offsets from their Roots, and thrive as well as in their native Countries.

PANICLE. A Panicle is a Stalk diffused into several Pedicles or Foot Stalks, sustaining the Flowers or Fruits, as in Oats, &c.

PANICUM. *Tourn. Inst. R. H.* 515. *Tab.* 298. *Lin. Gen. Plant.* 70. Panic; in French, *Panis*.

The Characters are,

There is one Flower in each Chaff, the Chaff opens with 3 oval Valves, ending in acute Points. The Petals open with 2 oval, acute-pointed Valves. The Flowers have 3 short Hair-like Stamina, terminated by oblong Summits, and a roundish Germen supporting two Hair-like Styles, crowned by feathered Stigmas. The Germen becomes a roundish Seed, fastened to the withered Petals.

The Species are,

1. PANICUM *spicâ simplici cernuâ, setis brevioribus, pedunculo hirsuto*. Panic with a single nodding Spike, short Awns, and a hairy Foot Stalk. This is the *Panicum Germanicum, sive paniculâ minore*. *C. B. P.* 27. German Panic with a smaller Panicle.

2. PANICUM *spicâ compositâ, spiculis glomeratis, setis immixtis, pedunculo hirsuto*. *Lin. Sp. Pl.* 56. Panic with a compounded Spike, whose smaller Spikes grow in Clusters intermixed with Awns, and a hairy Foot Stalk. This is the *Panicum Italicum sive paniculâ majore*. *C. B. P.* 27. Italian Panic with a larger Spike.

3. PANICUM *spicâ simplici longissimâ, setis hispidis, pedunculo hirsuto*. Panic with the longest single Spike, prickly Awns, and a hairy Foot Stalk. This is the *Panicum Indicum, spicâ longissimâ*. *C. B. P.* 27. Indian Panic with the longest Spike.

4. PANICUM *spicâ tereti, involucellis bifloris fasciculato-pilosis*. *Flor. Zeyl.* 44. Panic with a taper Spike having two Flowers in each Cover, and Hairs growing in Clusters. This is the *Panicum Indicum altissimum*, *Tourn. Inst.* 515. Tallest Indian Panic.

5. PANICUM *spicâ simplici æquali, pedunculis bifloris*. *Pred. Leyd.* 54. Panic with an equal single Spike, and two Flowers growing on each Foot Stalk. This is the *Panicum Indicum, spicâ obtusâ cæruleâ*. *C. B. P.* 7. Indian Panic, with an obtuse blue Spike.

There are several other Species of this Genus, than are here enumerated, some of which grow naturally in *England*; but as they are not cultivated, so it would be swelling this Work too much, if they were inserted here.

The 1st Sort grows naturally in *Germany* and *Hungary*; of this there are 3 Varieties, one with yellow Grain, another with white, and the third has purple Grains. This hath been formerly cultivated for Bread, in some of the northern Countries. It rises with a jointed Reed-like Stalk about 3 Feet high, and about the Size of the common Reed, garnished at each Joint with one Grass-like Leaf a Foot and a Half long, and about an Inch broad at the Base where broadest, ending in acute Points; they are rough to the Touch, embracing the Stalk at their Base, and turn downward about half their Length. The Stalks are terminated by compact Spikes, which are about the Thickness of a Man's Finger at their Base,

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Base, growing taper toward their Points, and are 8 or 9 Inches long, closely set with small roundish Grain, like that of Millet. This is an annual Plant, which perishes soon after the Seeds are ripe.

The 2d Sort is frequently cultivated in Italy, and other warm Countries. This rises with a Reed-like Stalk near 4 Feet high, which is much thicker than that of the former; the Leaves are also broader, but of the same Shape. The Spikes are a Foot long, and twice the Thickness of those of the former, but not so compact, being composed of several roundish clustered Spikes; the Grain is also larger, but of the same Form. There are 2 or 3 Varieties of this which differ only in the Colour of their Grain; this is also annual.

The 3d Sort grows naturally in both Indies; this hath a Reed-like Stalk as large as a Man's Thumb rising upward of 5 Feet; the Leaves are 2 Inches broad, and more than 2 Feet long, of the same Form with those of the former Sort; the Spikes at the Top are a Foot and a Half long, very compact, and thicker than a Man's Thumb at the Base, growing taper toward the Top. The Seeds are much larger than the other Sorts, and are in some white and others yellow.

The 4th Sort grows naturally in both Indies; this hath a strong Reed-like Stalk, which rises 6 or 7 Feet high, garnished with Leaves more than 3 Feet long; they are near 3 Inches broad at the Base, lessening to a Point at the End, having a smooth Surface; the Spikes arise at the Wings of the Stalk, they are single, but not so compact as those of the former, having soft Awns or Beards; they are about 6 Inches long, and stand on very long Foot Stalks; the Grain of this is pretty large.

The 5th Sort grows naturally in Peru; this rises with a Reed-like Stalk 6 Feet high, which sends out 2 or 3 Branches from the Sides, and is garnished with long Leaves 2 Inches broad at the Base; the Stalks are of a purple Colour, the Leaves are also inclining to the same Colour. The Spikes come out from the Wings of the Stalks, and at the End of the Branches; they are about 4 or 5 Inches long, thicker than a Man's Thumb, and almost equal at the Point with the Base. They are of a pale blue, having pretty long Awns or Beards of the same Colour, as are also the Seeds, which are larger and rounder than those of the other Sorts.

The 2 first Sorts are sown in several Parts of Europe, in the Fields, as Corn, for the Sustenance of the Inhabitants, but it is reckoned not to afford so good Nourishment as Millet; however, it is frequently used in some Parts of Germany and Italy, to make Cakes and Bread, but the German is not so much esteemed as the Italian Sort; but as it will ripen better in cold Countries than that, it is generally cultivated where a better Sort of Grain will not succeed.

The Seeds of these Sorts may be sown in Spring, at the Time Barley is sown, and may be managed exactly in the same Way; but this should not be sown too thick, for these Seeds are very small, and the Plants grow stronger, therefore require more Room. The German Sort doth not grow above 3 Feet high unless it is sown on very rich Land; in which Case it will rise to be 4 Feet high, but the Leaves and Stems of this Corn are very large, so require to stand 4 or 5 Inches

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apart, otherwise they will grow up weak and come to little. These large growing Corns should be sown in Drills at about 18 Inches apart, so that the Ground may be hoed between the Rows, to keep them clear from Weeds, and the stirring of the Ground will greatly improve the Corn. In July the Corn will ripen, when it may be cut down and dried, and then should be housed.

The Italian Panic grows much larger than the German, and produces much larger Spikes; so should be allowed more Room to grow, otherwise it will come to little. This is also later before it ripens, so it is not very proper for cold Countries.

The other Sorts are Natives of very warm Countries, where they are used by the Inhabitants to make Bread. these grow very large, and require a good Summer, otherwise they will not ripen in this Country. The Seeds of these should be sown the End of March or Beginning of April, on a Bed of light rich Earth, in a warm Situation. They should be sown in Drills about 3 Feet asunder, and when the Plants come up, they must be kept clear from Weeds, and thinned where too close. When the Plants are grown tall, they should be supported by Stakes, otherwise the Winds will break them down; and when the Corn begins to ripen, the Birds must be kept from it, otherwise they will soon destroy it. These Sorts are preferred in curious Gardens for Variety, but are not worth cultivating for Use in England. The two last Sorts do not ripen here.

PANSIES. See Viola Tricolor.

PAPAVER. Tourn. Inst. R. H. 237. Tab. 119. Lin. Gen. Plant. 573. Poppy; in French, Pavot.

The Characters are,

The Empalement of the Flower is oval, indented, and composed of 2 almost oval, concave, obtuse Leaves, which fall off. The Flower has 4 large roundish Petals which spread open, with a great Number of Hair-like Stamina, terminated by oblong, compressed, erect Summits. In the Center is placed a large roundish Germen, having no Style, but is crowned by a plain, radiated, Target-shaped Stigma. The Germen becomes a large Capsule, crowned by the plain Stigma, having one Cell, opening in many Places at the Top under the Crown, and is filled with small Seeds.

The Species are,

1. PAPAVER capsulis glabris globosis, caule piloso multifloro, foliis pinnatifidis incis. Lin. Sp. Plant. 507. Poppy with smooth globular Heads, a hairy Stalk with many Flowers, and Wing-pointed cut Leaves. This is the *Papaver erraticum, rubrum, campestre*. J. B. 3. 395. Common, red, Field Poppy.

2. PAPAVER capsulis subglobosis torosis bispidis, caule folioso multifloro. Lin. Sp. Plant. 506. Poppy with globular Capsules which are furrowed and prickly, and a leafy Stalk bearing many Flowers. This is the *Argemone capitula brevior bispido*. J. B. 3. 396. *Argemone* with a shorter prickly Head.

3. PAPAVER capsulis clavatis bispidis, caule folioso multifloro. Lin. Sp. Plant. 506. Poppy with Nail-shaped prickly Heads, and a leafy Stalk bearing many Flowers. *Papaver erraticum, capite longiore bispido*. Tourn. Inst. Field Poppy with a longer prickly Head.

4. PAPAVER capsula bispida, scapo unifloro nudo bispido, foliis bipinnatis. Lin. Sp. Plant. 507. Poppy with prickly Heads, and a naked prickly Stalk bearing one Flower

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Flower, and double winged Leaves. This is the *Argemone Alpina coriandri folio*. C. B. P. 172. *Alpine Argemone* with a Coriander Leaf.

5. *PAPAVER capsulis glabris oblongis, caule multifloro levi, foliis pinnatis incis.* Lin. Sp. Plant. 508. Poppy with oblong smooth Heads, a smooth Stalk bearing many Flowers, and cut winged Leaves. This is the *Papaver luteum perenne, laciniato folio, Cambrobritannicum*. Raii Syn. Ed. 3. p. 309. Yellow, Welch, perennial Poppy, with a cut Leaf.

6. *PAPAVER capsulis bispidis, scapo unifloro nudo bispido, foliis simplicibus pinnato-finnatis.* Hort. Upsal. 136. Poppy with prickly Heads, a naked rough Stalk having one Flower, and single Leaves which are wingedly sinuated. This is the *Papaver erraticum, luteo flore, capite oblongo bispido*. Amman. Ruth. 61. Field Poppy with a yellow Flower, and an oblong prickly Head.

7. *PAPAVER capsulis glabris, caulibus unifloris, scabris, foliis pinnatis serratis.* Hort. Upsal. 136. Poppy with smooth Heads, rough leafy Stalks having one Flower, and sawed winged Leaves. This is the *Papaver Orientale birsutissimum flore magno*. Tourn. Cor. 17. Most hairy Eastern Poppy, with a large Flower.

8. *PAPAVER calycibus capsulisque glabris, foliis amplexicaulibus incis.* Lin. Sp. Plant. 508. Poppy with smooth Capsules and Empalements, and cut Leaves embracing the Stalks. This is the *Papaver bortenfe, nigro semine, sylvestre Dioscoridis, nigrum Plinii*. C. B. P. 170. Garden Poppy with black Seeds.

9. *PAPAVER capsulis ovatis glabris, foliis latioribus amplexicaulibus marginibus inciso-serratis.* Poppy with oval smooth Heads, and broader Leaves embracing the Stalks, which are cut on their Edges like the Teeth of a Saw. *Papaver bortenfe, semine albo, sativum Dioscoridis, album Plinii*. C. B. P. 170. Garden Poppy with white Seeds, commonly called White Poppy.

The 1st Sort is the common red Poppy, which grows naturally on arable Land in most Parts of England; from the Flowers of this Sort is drawn a simple Water and a Tincture, also a Syrup and Conserve for medicinal Use. It is an annual Plant; from the Roots rise several rough branching Stalks a Foot and a Half high, garnished with hairy Leaves 5 or 6 Inches long, deeply jagged almost to the Mid-rib, those on the lower Part of the Leaves being the deepest; these Jags are opposite and regular, like those of the winged Leaves. At the Top of each Stalk stand the Flowers, which have oval hairy Empalements, opening with 2 Valves, and soon fall away. The Flowers are composed of 4 large roundish Petals, narrow at their Base, but spread out in a circular Order; they are of a beautiful scarlet Colour, and soon fall off. These appear in June, and are succeeded by oblong smooth Heads, crowned by the flat Target-shaped Stigma, and perforated in several Places at the Top, filled with small purplish coloured Seeds. There are several Varieties of this with double Flowers cultivated in Gardens; some of them have white Flowers, others have red bordered with white, and some have variegated Flowers; but as these Varieties have been produced by Culture from the Seeds of the common Sort, they should be included in that Species.

The 2d Sort grows naturally among Corn in many

Parts of England; the Leaves of this are much smaller than those of the first, and are cut into much finer Segments; the Stalks are slender, a little more than a Foot high, not so branching as the former. The Flowers are not so large, and of a deep red Colour, very soon falling away, seldom lasting more than a whole Day; these are succeeded by oblong prickly Heads, filled with small black Seeds. It flowers in June.

The 3d Sort grows naturally among Corn in some Parts of England, but not in so great Plenty as either of the former. The Leaves of this are finer cut and smaller than those of the first Sort, but are not so fine as those of the second; the Stalks do not rise so high as either of the former, and seldom have many Branches. The Flowers are not half so large as either of the former, and are of a Copper Colour, falling away in a few Hours. These appear in May, and are succeeded by long, slender, prickly Heads which are channelled, filled with small, black, shriveled Seeds.

The 4th Sort grows naturally on the Alps, among the Rocks. The Leaves are smooth and doubly winged, the Segments finely cut; the Stalks rise about a Foot high, sustaining one small yellow, or Copper Colour Flower, which is succeeded by roundish prickly Heads, filled with small Seeds. This flowers in May.

The 5th Sort has a perennial Root; it grows naturally in Wales, and in some of the northern Counties in England. I found it growing plentifully near Kirby Lonsdale in Westmoreland. Tournefort also found this Plant on the Pyrenean Mountains. The Leaves are winged; the Lobes are deeply cut on their Edges; the Stalks rise a Foot high; they are smooth, and garnished with a few small Leaves of the same Shape as the lower. The upper Part of the Stalk is naked, sustaining one large yellow Flower. These appear in June, and are succeeded by oblong smooth Capsules, filled with small purplish Seeds.

The 6th Sort grows naturally on the Confines of Russia near Tartary. The Leaves of this are single, and sinuated almost to the Mid-rib in Form of a winged Leaf; they are rough and hairy. The Stalk rises near 2 Feet high, it is slender, naked, sustaining one Flower at the Top, composed of 4 roundish Petals of a pale yellow Colour, each having a dark Bottom or Tail. The Flowers have an agreeable Scent, but are of short Duration. They come out in June, and are succeeded by long rough Capsules, filled with small Seeds.

The 7th Sort grows naturally in Armenia, from whence Dr. Tournefort sent the Seeds to the royal Gardens at Paris, where they succeeded, and were afterward communicated to the curious Gardens in England and Holland. The Root of this Plant is composed of 2 or 3 strong Fibres as thick as a Man's little Finger, which are a Foot and a Half long, of a dark brown on their Outside, and full of a milky Juice, which is very bitter and acrid. The Leaves are winged, and sawed on their Edges; they are a Foot long, closely covered with bristly white Hairs. The Stalks rise two Feet and a Half high; they are very rough and hairy, garnished below with Leaves like those at Bottom, but smaller; the upper Part is naked, sustaining at Top one very large Flower of the same Colour with the common red Poppy.

Poppy. These appear in *May*, and are succeeded by oval smooth Capsules, filled by purplish Seeds.

There are 2 or 3 Varieties of this which differ only in the Colour of their Flowers, and, I have been informed, there is a double Flower of this Kind, but have not seen it. *Tournefort* says, the *Turks* eat the green Heads of this, although they are very bitter and acrid.

The 8th Sort is the common black Poppy; the Seeds of which are sold in the Shops by the Title of Maw Seed. The Sort with single Flowers grows in the warm Parts of *Europe* naturally; this is annual; the Stalks rise 3 Feet high; these are smooth and divide into several Branches garnished with large Leaves, which are smooth and deeply cut or jagged on their Edges, embracing the Stalks with their Base. The Flowers grow on the Top of the Stalks; they are composed of 4 large roundish Petals of a purplish Colour with dark Bottoms, and are succeeded by oval smooth Capsules filled with black Seeds. It flowers in *June*, and the Seeds ripen the latter End of *August*.

There are great Varieties in the Flowers of this Sort, some having very large double Flowers, which are variegated of several Colours, some are red and white, others purple and white, and some are finely spotted like Carnations; so that during their short Continuance in flower, there are few Plants, whose Flowers appear so beautiful, but having an offensive Scent, and being of short Duration, they are not much regarded.

The Leaves of this Sort are used as an Ingredient in cooling Ointments, and the Heads of this were an Ingredient in the *Syrupus e Melonio*, but in the late Dispensaries they have been left out.

The 9th Sort is the common white Poppy; this is cultivated in Gardens for the Heads which are used in Medicine. The Stalks of this are large, smooth, and rise 5 or 6 Feet; they branch out into several small Branches, and are garnished with large grayish Leaves, whose Base embraces the Stalks; they are jagged irregularly on their Sides. The Flowers terminate the Stalks; these when inclosed in the Empalement nod downward, but before the Flowers open, they are erect. The Empalement of the Flower is composed of 2 large oval Leaves of the same grayish Colour as the other; these separate and soon drop off. The Flower is composed of 4 large, roundish, white Petals, which are of short Duration, and are succeeded by large roundish Heads, as big as Oranges, flattened at both Ends, having indented Crowns, and are filled with small white Seeds. This flowers in *June*, and the Seeds ripen in *August*.

There are several Varieties of this Sort, which differ in the Colour of their Flowers and Multiplicity of Petals; those with beautiful Flowers are preserved in Gardens for Ornament, but that with the single Flowers only is cultivated for Use. The Seeds of this Sort are used in Emulsions, being cooling and good in Fevers, and inflammatory Distempers, as also for the Strangury and Heat of Urine. Of the dry Heads infused and boiled in Water is made the *Diatodium* of the Shops.

It has been generally supposed, that from the Heads of this Sort of Poppy, the Opium is extracted; but one of the Heads which I have by me, from which Opium had been extracted in *Turkey*, is of a different Shape from those of this Sort.

All the Sorts of Poppy are propagated by Seeds, but the 5th and 7th Sorts, having perennial Roots, may also be propagated by Offsets. The best Time for sowing the Seeds is in *September*, when they will more certainly grow than those which are sown in Spring; and the annual Sorts will make larger Plants, and flower better than when they are sown in Spring. The best Way is to sow the Seeds of the annual Kinds in the Places where they are to remain, and to thin the Plants where too close; those of the large Kinds should not be left nearer to each other than a Foot and a Half, and the smaller Sorts may be allowed about half that Space. The Culture they require after, is only to keep them clean from Weeds.

Those who are curious to have fine Poppies in their Gardens, carefully look over their Plants when they begin to flower, and cut up all those Plants, whose Flowers are not very double and well marked, before they open their Flowers, to prevent their Farina mixing with their finer Flowers, which would degenerate them; and it is the not being careful of this, that causes the Flowers to degenerate so frequently in many Places, which is often supposed to be occasioned by the Ground.

The yellow *Welsh* Poppy requires a cool shady Situation, where the Plants will thrive, and produce Plenty of Seeds annually. If these Seeds are permitted to scatter, the Plants will come up better than when sown by Hand; but if they are sown, it should be always in Autumn, for the Seeds sown in Spring, rarely succeed.

The best Time to transplant, and part the Roots of this Sort, is in Autumn, that the Plants may be well established in their new Quarters, before the dry Weather comes on in Spring.

The eastern Poppy will thrive either in Sun or Shade for I have several of these Plants growing under Trees where they have thriven many Years, and flower full as well as those in an open Situation, but come later in the Season. This will propagate very fast by its Roots, so there is no Necessity for sowing the Seeds, unless to procure new Varieties. This Sort should be transplanted in Autumn, and if the Seeds are sown, it should be at the same Time for the Reasons before given.

PAPAVER CORNICULATUM. See Glaucium.

PAPAVER SPINOSUM. See Argemone.

PAPAYA. See Carica.

PAPILIONACEOUS. A papilionaceous (or Pea Bloom) Flower is so called, because in some Measure, it resembles a Butterfly with its Wings expanded. It always consists of these Parts; the Vexillum or Standard, which is a large erect Segment or Petal; the Alae, or two Wings, which compose the Sides, and the Carina, or Keel, which is a concave Petal or Segment, resembling the lower Part of a Boat: This Keel is sometimes entire, and sometimes it consists of two Petals or Segments adhering pretty closely together. Of this Tribe are Peas, Beans, Kidney Beans, Vetches, and other leguminous Plants.

PAPPOSE PLANTS are such as have their Seeds covered with a Down, which adheres to the upper Part of the Seed, and are of Use to spread them when ripe, by sustaining them in the Air, so that they may be conveyed to a great Distance. Of this Kind are the Sow-thistles, Hawkweeds, Dandelion, Starworts, &c.

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PARASITICAL Plants are such as are produced out of the Trunk or Branches of other Plants, from whence they receive their Nourishment, and will not grow upon the Ground, as the Mistleto, &c.

PARIETARIA. *Tourn. Inst. Lin. Gen. Pl.* 1020. [so called from *Paries*, Lat. a Wall, because it grows on old Walls.] Pellitory; in French, *Parietaire*.

The Characters are,

It hath hermaphrodite and female Flowers upon the same Plant. There are two hermaphrodite Flowers contained in a six-leaved Involucrum; these have a quadrifid plain Empalement of one Leaf, half the Size of the Involucrum. They have no Petals, but four permanent Awl-shaped Stamina, longer than the Empalement, terminated by Twin Summits, with an oval Germen supporting a slender coloured Style, crowned by a pencil-shaped Stigma. The Germen afterward turns to an oval Seed wrapped up in the Empalement. The female Flowers have no Stamina, but in other Respects are the same as the hermaphrodite.

The Species are,

1. **PARIETARIA** *foliis lanceolatis alternis*. Pellitory with Spear-shaped Leaves placed alternately. This is the *Parietaria officinarum* & *Dioscoridis*. *C. B. P.* 121. The officinal Pellitory of *Dioscorides*.

2. **PARIETARIA** *foliis ovatis alternis*. Pellitory with oval Leaves placed alternately. This is the *Parietaria minor* *Ocimi folio*. *C. B. P.* 121. Smaller Pellitory with a Basil Leaf.

The 1st Sort grows naturally in Germany and Holland, but was not in England till the Year 1727, when I brought it here. This is supposed to be the true Sort recommended by the Ancients to be used in Medicine; it hath a thick perennial Root, composed of fleshy reddish Fibres, from which arise many Stalks a Foot and a Half high, garnished with hairy Spear-shaped Leaves about 2 Inches long, and one broad, in the Middle, having several Veins. The flowers come out in small Clusters on the Side of the Stalks; they are small, of an herbaceous Colour, so make no Figure. These appear in Succession all the Summer Months, and the Seeds ripen accordingly, which are cast out to a Distance with an Elasticity when ripe.

The 2d Sort grows plentifully on old Walls, and the Sides of dry Banks in most Parts of England; this differs from the former in having shorter Stalks, and smaller oval Leaves. The Flowers are also less, and are in smaller Clusters; in other Respects they are the same.

They may be propagated in Plenty from a single Plant, which, if permitted to scatter its Seeds, will fill the Ground about it with young Plants, for the Seeds are very difficult to collect, as they are thrown out of their Covers as soon as they are ripe.

PARIS. *Lin. Gen. Plant.* 449. *Herba Paris*. *Tourn. Inst. R. H.* 233. *Tab.* 117. True love or One-berry.

The Characters are,

The Empalement of the Flower is permanent, and composed of 4 Leaves, which expand in Form of a Cross. The Flower also hath 4 Leaves, which spread open in the same Manner, and are permanent. In the Center of the Flower is situated a roundish four-cornered Germen, supporting 4 spreading Styles, crowned by single Summits. This is attended by 8 Stamina, each having an oblong Summit fastened by Threads on each Side to the Stamina. The

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Germen changes to a roundish Berry, having 4 Cells filled with Seeds.

We know but one Species of this Genus, viz.

PARIS *foliis quaternis*. *Flor. Lapp.* 155. Herb Paris, True-love, or One-berry.

This Plant grows wild in moist shady Woods in England, especially in the northern Counties; and is with great Difficulty preserved in Gardens. The only Method to procure it, is to take up the Plants from the Places where they grow wild, with good Balls of Earth to their Roots, and plant them in a shady moist Border, where they may remain undisturbed; in which Situation they will live some Years; but as it is a Plant of little Beauty, it is rarely preserved in Gardens.

PARKINSONIA. *Plum. Nov. Gen.* 25. *Tab.* 3. *Lin. Gen. Plant.* 460.

The Characters are,

The Empalement of the Flower spreads open; it is of one Leaf, indented in 5 Parts at the Tap. The Flower has almost 5 equal Petals placed circularly; the 4 upper are oval, the under is Kidney-shaped. It has 10 declining Stamina terminated by oblong Summits, and a long taper Germen with scarce any Style, crowned by an obtuse Stigma. The Germen becomes a long taper Pod with swelling Joints, in each of which is lodged one oblong Seed.

We know but one Species of this Plant, which is

PARKINSONIA *aculeata, foliis minutis, uni costæ adnexus*. *Plum. Nov. Gen.* 25. Prickly Parkinsonia with very small Leaves, fastened to one middle Rib.

This Plant was discovered by Father Plumier in America, who gave it this Name in Honour of Mr. John Parkinson, who published an universal History of Plants in English, in the Year 1640.

It is very common in the Spanish West-Indies, but of late it has been introduced into the English Settlements in America for the Beauty and Sweetness of its Flowers. This, in the Countries where it grows naturally, rises to a Tree of 20 Feet high or more, and bears long slender Bunches of yellow Flowers, which hang down after the Manner of the Laburnum. These Flowers have a most agreeable sweet Scent, so as to perfume the Air to a considerable Distance; for which Reason the Inhabitants of the West-Indies plant them near their Habitations. And though this Plant has not been introduced many Years into the English Settlements, yet it is now become so common in all the Islands, that but few Houses are without some of the Trees near it; for it produces Flowers and Seeds in Plenty in about 2 Years from Seed; so it may soon be made common in all hot Countries; but in Europe it requires a Stove, otherwise it will not live through the Winter.

This Plant is propagated by Seeds, which should be sown in small Pots filled with light fresh Earth early in the Spring, and the Pots plunged into a hot Bed of Tanners Bark, where, in about 3 Weeks or a Month, the Plants will come up, when they should be kept clear from Weeds, and frequently refreshed with Water. In a little Time these Plants will be fit to transplant, which should be done very carefully, so as not to injure their Roots. They must be each planted in a Half-penny Pot filled with light fresh Earth, and then plunged into the hot Bed again, observing to stir up the Tan; and if it hath lost its Heat, there should be some

X

fresh

fresh Tan added, to renew it again. Then shade the Plants from the Heat of the Sun, until they have taken new Root; after which they should have fresh Air admitted to them every Day, in Proportion to the Warmth of the Season. With this Management the Plants will grow so fast, as to fill the Pots with their Roots by the Beginning of July, when they should be shifted into Pots a little larger than the former, and plunged again into the Bark Bed to forward their taking new Root; after this it will be the best Way to inure the Plants by Degrees to bear the open Air, that they may be hardened before Winter; for if they are kept too warm in Winter, the Plants will decay before the next Spring. The only Method by which I have succeeded in keeping this Plant through the Winter was by hardening them in July and August to bear the open Air; and in September I placed them on Shelves in the dry Stove, at the greatest Distance from the Fire, so that they were in a very temperate Warmth; and there they retained their Leaves all the Winter, and continued in Health, when those which were placed in a warmer Situation, as also those in the Green-house, were entirely destroyed.

PARNASSIA. *Tourn. Inst. R. H. 246. Tab. 127. Lin. Gen. Plant. 345.* Grass of Parnassus.

The Characters are,

The Flower hath a permanent spreading Empalement, cut into 5 Parts. The Flower has 5 roundish, concave, spreading Petals, which have 5 Heart-shaped concave Nectariums, and 5 Stamina terminated by depressed Summits, with a large oval Germen having no Style, but 4 obtuse permanent Stigmas in their Place. The Germen turns to an oval 4 cornered Capsule with one Cell, containing several oblong Seeds.

The Species are,

1. **PARNASSIA palustris & vulgaris.** *Inst. R. H. Common Marsh Grass of Parnassus.*

2. **PARNASSIA vulgaris, flore pleno.** Common Grass of Parnassus, with a double Flower.

The former of these Sorts grows wild in moist Meadows in England, particularly in the North; but it doth not grow in the Neighbourhood of London, any nearer than on the other Side of Watford, in the low Meadows by Cassiobery, where it is in great Plenty.

The other Sort is an accidental Variety of the former, which has been discovered wild, and transplanted into Gardens. This is but rarely to be found, being in very few Gardens at present.

These Plants may be taken up from the natural Places of their Growth, with Balls of Earth to their Roots, and planted in Pots filled with strong fresh undunged Earth, and placed in a shady Situation, where, if they are constantly watered, they will thrive very well, and flower every Summer; but if they are planted in the full Ground, it should be in a very moist shady Border, otherwise they will not live; and these should be as duly watered, as those in the Pots in dry Weather, to make them produce strong Flowers.

They may be propagated by parting their Roots, which should be done in March, before they put out new Leaves; but the Roots should not be divided too small, for that will prevent their flowering the following Summer. These Roots should always be planted in strong fresh Earth, for they will not thrive in a light rich Soil. In Spring they must be constantly watered,

if the Season proves dry, otherwise they will not flower; nor should they be parted oftener than every third Year, to have them strong. They flower in July, and their Seeds are ripe the latter End of August.

It is called *Parnassus*, from Mount *Parnassus*, on which it was supposed to grow; and from the Cattle feeding on it, it was called a Grass, though the Plant has no Resemblance to any of the Grass Kind, but is more like to the *Ranunculus* in Flower, and the Leaves are pretty broad, oblong, and smooth.

PARONYCHIA. *Tourn. Inst. R. H. 507. Tab. 281. Illecebrum. Lin. Gen. Plant. 256.* Mountain Knot Grass.

The Characters are,

The Empalement of the Flower is five cornered, and composed of 5 coloured Leaves which are permanent. The Flower has no Petals; they have 5 Hair-like Stamina within the Empalement, terminated by single Summits, and an oval acute Germen, sitting on a short Style, crowned by an obtuse Stigma. The Empalement turns to a roundish Capsule with one Cell, opening with 5 Valves, containing one large, roundish, acute-pointed Seed.

The Species are,

1. **PARONYCHIA floribus sessilibus axillaribus, bracteis nitidis, caulibus procumbentibus.** Mountain Knot Grass, with Flowers sitting close to the Wings of the Stalks, neat Bractæ and trailing Stalks. This is the *Paronychia Hispanica*. *Clus. Spanish Mountain Knot Grass.*

2. **PARONYCHIA caulibus diffusis procumbentibus floribus conglomeratis, bracteis nitidis.** Mountain Knot Grass with diffused trailing Stalks, Flowers growing in Clusters, and neat Bractæ. This is the *Paronychia Hispanica niviæa polyanthus*. *Barrel. Observ. Silvery Spanish Mountain Knot Grass, having many Flowers.*

There are 2 or 3 other Species of this Genus, which grow naturally in the South of France and Italy, which having little Beauty, are rarely admitted into Gardens, so it would be needless to enumerate them here.

The 1st Sort here mentioned, grows naturally in Spain; this hath trailing Stalks like those of common Knot Grass, a Foot and a Half long, putting out several Side Branches, garnished with small Leaves like those of the common Knot Grass, but smaller, sitting close to the Stalks. The Flowers come out at the Wings of the Leaves, sitting close to the Stalks; these have silvery neat Bractæ, which inclose the Flowers, which are so small as not to be visible, unless they are near the Sight. The Flowers appear in July, but unless the Season is very warm, the Seeds do not ripen in England.

The 2d Sort grows naturally in Spain; the Stalks of this are larger, and the Branches more diffused than those of the 1st Sort, but trail on the Ground in like Manner. The Flowers come out in close Clusters upon short Foot Stalks from the Side of the Branches, surrounded by Leaves shaped like those of the broad-leaved Knot Grass; the Bractæ of these Flowers are silvery, like those of the first Sort.

These Plants seldom continue longer than two Years, and do not ripen Seeds here, but in warm dry Seasons; but Cuttings of them will take Root. The Plants will rise from Seeds in the open Air, and will live abroad in mild Winters, but in hard Frosts they are destroyed.

PARSLEY. See *Apium*.

PARSNIP. See *Pastinaca*.

PAR-

PARTERRE is a level Division of Ground, which, for the most part, faces the South and best Front of a House, and is generally furnished with Greens, Flowers, &c.

There are several Sorts of Parterres, as plain Grass with Borders, and Parterres of Embroidery, &c.

Plain Parterres are more beautiful in England than in any other Countries, by Reason of the Excellency of our Turf, and that Decency, and unaffected Simplicity, that it affords to the Eye of the Spectator.

Others are cut into Shell and Scroll Work, with Sand Alleys between them, which are the finest Parterre Works esteemed in France.

As to the general Proportion of Parterres, an Oblong or long Square is accounted the most proper Figure; because by the Rules of Perspective, or the natural Declension of the visual Rays, a long Square sinks almost to a Square and an exact Square appears much less than it really is, therefore a Parterre should not be less than twice as long as it is broad; twice and a Half is accounted a very good Proportion, and it is very rare that three Times is exceeded.

As to the Breadth of a Parterre, it is to take its Dimensions from the Breadth of the Front of the House. If the Front of the House is one hundred Feet long, the Breadth of the Parterre should be one hundred and fifty Feet; and if the Front of the House be two hundred Feet, the Parterre should be fifty Feet broader; but where the Front of the House exceeds the Breadth of this Parterre, it will be a good Proportion to make the Parterre of the same Dimension with the Front.

Some do not approve of making Parterres very broad, because it makes them appear too short; when nothing is more pleasing to the Eye, than a contracted regular Conduct and View, as soon as a Person goes out of a House or Building; and a forward direct View is the best, whether it be either Parterre or Lawn, or any other open Space, either two, three, or fourfold in the Width; and for that Reason, those Designs may justly be disapproved, by which the Nobleness of the View is marred at the immediate Entrance into the Garden, the angle of Light being broken and confused.

The making Parterres too large causes a great Expence, and occasions a Diminution of Wood, which is the most valuable Part of a Garden.

As to the adorning and furnishing these Parterres, whether it be plain or with Embroidery, that depends much upon the Form of them; and therefore must be left to the Judgment and Fancy of the Designer.

PARTHENIUM Lin. G. P. 939. *Partheniastrum*. Nissol. Aët. Par. 1711. Dill. Gen. Bastard Feverfew.

The Characters are,

It hath a Flower composed of hermaphrodite Florets and female half Florets, which are inclined in a common five-leaved spreading Empalement. The hermaphrodite Flowers which form the Disk, have one tubulous Petal cut into five Parts at the Brim; they have five Hair-like Stamina the Length of the Tube, terminated by thick Summits. The Germen is situated below the Flower, and is scarce visible, supporting a slender Style having no Stigma; these Flowers are barren. The female Flowers which compose the Rays or Border, are stretched out on one Side like a Tongue; these have a large Heart-shaped compressed Germen, with a slender

der Style crowned by two long, spreading Stigmas. These Flowers are succeeded by one Heart-shaped compressed Seed.

The Species are,

1. **PARTHENIUM** foliis compositis-multifidis. Lin. Hort. Cliff. 442. *Parthenium* with many-pointed compound Leaves. *Partheniastrum artemisiae folio, flore albo.* Hort. Cbelsf. 152. Bastard Feverfew, with a Mugwort Leaf.

2. **PARTHENIUM** foliis ovatis crenatis. Lin. Hort. Cliff. 442. *Parthenium* with oval crenated Leaves. This is the *Partheniastrum belenii folio.* Hort. Elth. 302. Tab. 225. Bastard Feverfew with an Elecampane Leaf.

The 1st Sort grows wild in great Plenty in Jamaica, and in some of the English Settlements in the West-Indies, where it is called wild Wormwood, and is used by the Inhabitants as a vulnerary Herb.

The 2d Sort grows plentifully in several Parts of the Spanish West-Indies, from whence the Seeds have been brought to Europe.

The first Sort is an annual Plant, which may be propagated by sowing the Seeds on a hot Bed early in the Spring; and when the Plants are come up, they should be transplanted on another hot Bed, at about 5 or 6 Inches Distance, observing to water and shade them until they have taken new Root; after which they must have a large Share of fresh Air in warm Weather, by raising the Glasses of the hot Bed every Day, and they must be duly watered every other Day at least. When the Plants have grown so as to meet each other, they should be carefully taken up, preserving a Ball of Earth to their Roots, and each planted in a separate Pot, filled with light rich Earth; and if they are plunged into a moderate hot Bed, will greatly facilitate their taking fresh Root; but where this Convenience is wanting, the Plants should be removed to a warm sheltered Situation, where they must be shaded from the Sun until they have taken new Root; after which they may be exposed with other hardy annual Plants, in a warm Situation, where they will flower in July, and their Seeds ripen in August. But if the Season should prove cold and wet, it will be proper to have a Plant or two in Shelter, either in the Stove, or under tall Frames, in order to have good Seeds, lest those Plants which are exposed should fail.

The 2d Sort is a perennial Plant, which dies to the Ground every Autumn, and shoots up again the following Spring. The Seeds of this Sort were sent me by Dr. Thomas Dale, from South Carolina, where the Plants grow wild. This may be propagated by parting the Roots in Autumn, and may be planted in the full Ground, where it will abide the Cold of our ordinary Winters very well. This Sort flowers in July, but seldom produces good Seeds in England.

These Plants make no great Appearance, so are seldom cultivated but for the Sake of Variety.

PASQUE FLOWER. See Pulsatilla.

PASSERINA. Lin. Gen. Plant. 440. *Thymelæa*. Tourn. Inst. Pluk. Sanamundu. Clusf. Sparrow-wort.

The Characters are,

The Flower has no Empalement; it has one withered Petal, having a slender cylindrical Tube swelling below the Middle, and divided into four Parts at the Top, which spread open. It hath 8 bristly Stamina, sitting on the Top of the Tube, terminated by erect Summits almost oval. It has

an oval Germen under the Tube, having a slender Style rising on one Side of the Top of the Germen, crowned by a beaded Stigma, set with prickly Hairs on every Side. The Germen turns to an oval Seed pointed at both Ends, inclosed in a thick oval Capsule of one Cell.

The Species are,

1. *PASSERINA foliis linearibus convexis quadrifariam imbricatis, ramis tomentosis.* Lin. Sp. Plant. 559. Sparrow-wort with linear convex Leaves imbricated four Ways, and downy Branches. This is the *Thymelæa Ethiopica*, *passerinae foliis.* Breyn. Cent. 10. fig. 6. Ethiopian Spurge Laurel, with Sparrow-wort Leaves.

2. *PASSERINA foliis carnosis extus glabris, caulibus tomentosis.* Lin. Sp. Plant. 559. Swallow-wort with fleshy Leaves, which are smooth on their Outside, and downy Stalks. This is the *Sanamunda* 3. Clus. Hist. 1. p. 89. The third *Sanamunda* of Clusius.

3. *PASSERINA foliis lanceolatis subciliatis erectis, ramis nudis.* Lin. Sp. Plant. 559. Swallow-wort with Spear-shaped erect Leaves, having small Hairs and naked Branches. This is the *Sanamunda* 1. Clus. Hist. 88. The first *Sanamunda* of Clusius.

4. *PASSERINA foliis linearibus oppositis, floribus terminalibus solitariis, ramis glabris.* Lin. Sp. Plant. 560. Sparrow-wort with linear Leaves placed opposite, single Flowers terminating the Branches, and smooth Stalks. This is the *Thymelæa ramosa linearibus foliis angustis, flore solitaria.* Burm. Afr. 131. Branching Spurge Laurel, with narrow linear Leaves and a single Flower.

The 1st Sort grows naturally at the Cape of Good Hope, from whence it was first brought to the Gardens in Holland. This rises with a shrubby Stalk 5 or 6 Feet high, sending out Branches the whole Length; these, when young, grow erect, but as they advance in Length, they incline toward an horizontal Position; but more so, when the small Shoots toward the End, are full of Flowers and Seed Vessels, which weigh down the weak Branches from their upright Position. The Branches are covered with a white Down like Meal, and are closely garnished with very narrow Leaves which are convex, and lie over each other in 4 Rows like the Scales of Fish, so that the young Branches seem as if they were four cornered. The Flowers come out at the Extremity of the young Branches, from between the Leaves, on every Side; they are small and white, so make but little Appearance, and are succeeded by small Seed Vessels, which seem withered and dry. The Flowers come out in June and July, but the Seeds do not ripen here.

This Plant may be propagated by Cuttings during any of the Summer Months; these may be planted in a Bed of loamy Earth, and closely covered with a Bell or Hand Glâs to exclude the Air, shading them every Day from the Sun, and refreshing them now and then with Water. With this Treatment the Cuttings will take Root in about 2 Months, when they may be taken up and each planted in a small Pot, filled with soft loamy Earth, placing them in the Shade till they have taken new Root; then they may be removed into a sheltered Situation, where they may remain till October, when they must be placed in the Green-house, for they will not live in the open Air through the Winter in England, but require no other Treatment, than Myrtles and other

hardy Green-house Plants, which is only to screen them from Frost. As this Plant retains its Verdure all the Year, it makes a pretty Variety in the Green-house in Winter.

The 2d Sort grows naturally in Spain and Portugal; this hath shrubby Stalks, which rise to a greater Height than the former; the Branches grow more diffused than those of the former, they are covered with a mealy Down, and are garnished with short, thick, succulent Leaves, lying over each other like the Scales of a Fish; they are smooth and green on their Outside, but downy on their inner. The Flowers are small and white, like those of the former, and appear about the same Time. This will live abroad in ordinary Winters, if planted in a dry Soil and warm Situation; but in hard Frosts the Plants are frequently destroyed, therefore one or two should be kept in Pots, and sheltered in Winter to preserve the Species. This may be propagated by Cuttings, as the former Sort.

The 3d Sort grows naturally in Spain and Portugal, also at the Cape of Good Hope. This hath a shrubby Stalk rising 5 or 6 Feet high, sending out many Branches which are naked to their Ends, where they are garnished with oblong Leaves standing erect, which have hairy Points. The Flowers are small, white and come out between the Leaves at the End of the Branches; these appear in June, but are not succeeded by Seeds in England. This may be propagated by Cuttings as the 2 former, and requires the same Treatment.

The 4th Sort grows naturally at the Cape of Good Hope; it hath a low shrubby Stalk, which seldom rises more than a Foot high, dividing into many slender Branches, which are smooth, and spread out on every Side; these are garnished with very narrow Leaves placed opposite, they are of a dark green, and have the Appearance of those of the Fir Tree, but are narrower. The Flowers come out singly at the End of the Branches, these are larger than those of the former, and their upper Part is spread open almost flat; they are of a purple Colour, and appear about the same Time as the former. This may be propagated by Cuttings as the other Sorts, and the Plants treated as the first Sort.

PASSIFLORA. Lin. Gen. Plant. 910. *Granadilla.* Tourne. Passion Flower; in French, *Fleur de la Passion.*

The Characters are,

The Flower has a plain coloured Emplacement of five Leaves, and five half Spear-shaped Petals, which are large, plain and obtuse. The Nectarium hath a triple Crown; the outer, which is longer, is fastened to the Inside of the Petal, but is larger and compressed above. It has 5 Awl-shaped Stamina, fastened at their Base to the Column of the Style annexed to the Germen, spreading out, and terminated by oblong, obtuse, incumbent Summits. The Style is an erect cylindrical Column, upon whose Top sits an oval Germen, with three smaller Styles which spread out, crowned by beaded Stigmas. The Germen becomes an oval fleshy Fruit with one Cell, sitting at the End of the Style, filled with oval Seeds, fastened longitudinally to the Skin or Shell.

The Species are,

1. *PASSIFLORA foliis trilobis serratis.* Amoen. Acad. Vol. I. p. 230. Passion Flower with Leaves having three fawed Lobes. This is the *Granadilla Hispanica*, *flos passionis Italica.* Hern. Mex. 888. The *Granadilla* of the

the Spaniards, and the Passion Flower of the Italians, commonly called three-leaved Passion Flower.

2. PASSIFLORA foliis palmatis integerrimis. Amén. Acad. Vol. I. p. 231. Passion Flower, with Hand-shaped entire Leaves. This is the *Granadilla pentaphyllos*, flore caruleo magno. Boerb. Ind. alt. 2. p. 81. Five-leaved Passion Flower, with a large blue Flower, or the most common Passion Flower.

3. PASSIFLORA foliis trilobis cordatis æqualibus obtusis glabris integerrimis. Amén. Acad. Vol. I. p. 224. Passion Flower with Heart-shaped Leaves having three equal Lobes, which are smooth, obtuse, and entire. This is the *Granadilla folio tricuspidi*, flore parvo flavescente. Tourn. Inst. R. H. 240. Passion Flower with a three-pointed Leaf, and a small yellowish Flower.

4. PASSIFLORA foliis trilobis integerrimis, lobis sub-lanceolatis, intermedio productiore. Amén. Acad. Vol. I. p. 229. Passion Flower with Leaves having three entire Lobes, which are somewhat Spear-shaped, and have the Middle one longer than the others. This is the *Flos passionis minor*, folio in tres lacinias non serratis profundius diviso, flore luteo. Sloan. Cat. Jam. 104. Smaller Passion Flower with a Leaf deeply divided into three Segments which are not sawed, and a yellow Flower.

5. PASSIFLORA foliis trilobis integerrimis glabris, cortice suberoso. Passion Flower with Leaves having three entire smooth Lobes, and a Cork-like Bark. This is the *Flos passionis Curassavicus*, folio glabro, trilobato, & angusto, flore flavescente omnium minimo. Par. Bat. Pluk. Alm. 282. Passion Flower of Curassao, with a smooth Leaf having three Lobes, and the least yellow Flower.

6. PASSIFLORA foliis hastatis glabris, petalis forum angustioribus. Passion Flower with Halberd-pointed smooth Leaves, and narrow Petals to the Flowers. This is the *Granadilla folio amplo tricuspidi*, fructu olivæ-forma. Tourn. Inst. R. H. 240. Passion Flower with a large three-pointed Leaf, and an Olive-shaped Fruit.

7. PASSIFLORA foliis trilobis cordatis pilosis, involucri multifido-capillaribus. Amén. Acad. 1. p. 228. Passion Flower with Leaves having three hairy Lobes, and the Involucrium of the Flower composed of many-pointed Hairs. This is the *Granadilla fœtida*, folio tricuspidi villoso, flore albo. Tourn. Stinking Passion Flower with a hairy three-pointed Leaf, and a white Flower.

8. PASSIFLORA foliis hastatis pilosis amplioribus, involucri multifido capillaribus. Passion Flower with the largest Halberd-pointed hairy Leaves, and Empalements composed of many-pointed Hairs. This is the *Granadilla fœtida*, folio tricuspidi villoso, flore purpureo variegato. Tourn. Stinking Passion Flower with a hairy three-pointed Leaf, and a Flower variegated with purple.

9. PASSIFLORA foliis trilobis, basi utrinque denticulo reflexo. Amén. Acad. 1. p. 229. Passion Flower with Leaves having three Lobes, and a little indented on each Side the Base, which is reflexed. This is the *Granadilla folio hastato holoferico*, petalis candicantibus, fimbriis ex purpureo & luteo variis. Martyn. Dec. 51. Passion Flower with a silky Halberd-pointed Leaf, and Flowers having white Petals, which are variegated with a purple and yellow Colour.

10. PASSIFLORA foliis bilobis cordatis oblongis petiolatis. Lin. Sp. Plant. 957. Passion Flower with oblong Heart-shaped Leaves, having two Lobes standing upon Foot

Stalks. This is the *Granadilla flore suaverubente folio bicorni*. Tourn. Inst. R. H. 241. Passion Flower with a soft red Flower, and a Leaf ending with two Horns.

11. PASSIFLORA foliis bilobis cuneiformibus, basi biglandulosis, lobis acutis divaricatis. Amén. Acad. 1. 223. Passion Flower with Wedge-shaped Leaves having two Lobes, and two Glands at their Base, whose Lobes are acute, and spread from each other. This is the *Granadilla bicornis*, flore candido, filamentis intortis. Hort. Elth. 164 Tab. 137. Passion Flower with a two-horned Leaf, a white Flower, and intorted Filaments.

12. PASSIFLORA foliis bilobis obtusis, basi emarginatis petiolatis. Passion Flower with Leaves having two obtuse Lobes, which are indented at the Base and have Foot Stalks. This is the *Granadilla quæ Coanepilli seu Contrayerva*. Hernand. Passion Flower called *Coanepilli* or *Contrayerva* by Hernandez.

13. PASSIFLORA foliis bilobis glabris rigidis, basi indivisis. Passion Flower with stiff smooth Leaves having two Lobes, which are undivided at their Base. This is the *Granadilla folio bicorni*, glabro, rigidos flore albo. Houst. Mss. Passion Flower with a smooth two horned Leaf, and a white Flower.

14. PASSIFLORA foliis bilobis transversis amplexi-aubus. Amén. Acad. 1. p. 222. Passion Flower with transverse Leaves having two Lobes, and embracing the Stalk. This is the *Murucuia folio lunato*. Tourn. Inst. R. H. 251. Murucuia with a Moon-shaped Leaf.

15. PASSIFLORA foliis cordato-oblongis integerrimis, caule triquetra, involucri integerrimis. Passion Flower with Heart-shaped, oblong, entire Leaves, a three-cornered Stalk, and entire Covers to the Flowers. This is the *Granadilla latifolia*, fructu maliformi. Tourn. Inst. Broad-leaved Passion Flower with an Apple-shaped Fruit, commonly called *Granadilla* in the West-Indies.

16. PASSIFLORA foliis oblongis integerrimis, involucri dentatis. Passion Flower with oblong entire Leaves, and the Covers of the Flowers indented. This is the *Granadilla fructu citriformi*, foliis oblongis. Tourn. Inst. Passion Flower with a Citron-shaped Fruit, and oblong Leaves, called Water Lemon in the West-Indies.

17. PASSIFLORA foliis indivisis ovatis integerrimis, petiolis æqualibus. Amén. Acad. Vol. I. Passion Flower with undivided, oval, entire Leaves, and equal Foot Stalks. This is the *Granadilla Americana*, fructu subrotundo, corollâ floris erectâ, petalis amane sulcis, foliis integris. Mart. Cent. American Passion Flower with a roundish Fruit, an erect Corolla to the Flower, the Petals of a fine Copper Colour and entire Leaves.

18. PASSIFLORA foliis indivisis serratis. Amén. Acad. Passion Flower with undivided sawed Leaves. This is the *Granadilla Americana*, folio oblongo leviter serrato, petalis ex viridi rubescentibus. Martyn. Cent. 1. p. 36. American Passion Flower with oblong Leaves, slightly sawed, and Petals to the Flower of a greenish red Colour.

19. PASSIFLORA foliis indivisis oblongis integerrimis, floribus confertis. Amén. Acad. 1. p. 221. Passion Flower with undivided, oblong, entire Leaves, and Flowers growing in Clusters. This is the *Clematis Indica*, polyanthos odoratissima. Plum. Pl. Amer. 75. Tab. 90. Indian Climber having many sweet Flowers.

The 1st Sort grows naturally in Virginia and other Parts of North America; this was the first known in

Europe of all the Species, but was not very common in the *English* Gardens till of late Years. The Root of this is perennial, but the Stalk is annual in *North America*, dying to the Ground every Winter, as it also does in *England*, unless it is placed in a Stove. The Stalks of this are slender, rising about 4 or 5 Feet high, having Tendrils or Claspers at each Joint, which fasten themselves about whatever Plants stand near them, whereby the Stalk is supported. At each Joint comes out one Leaf upon a short Foot Stalk; these have for the most part 3 oblong Lobes, which join at their Base, but the 2 Side Lobes, are sometimes divided Part of their Length into 2 narrow Segments, so as to resemble a five-lobed Leaf; these are thin, of a light green, and slightly sawed on their Edges. The Flowers are produced from the Joints of the Stalk at the Foot Stalks of the Leaves; these have long slender Foot Stalks succeeding each other, as the Stalks advance in Height during the Summer Months. The Involucrum of the Flower is composed of 5 oblong blunt-pointed Leaves of a pale green; these open and disclose 5 more Leaves or Petals, which are white, having a Fringe or Circle of Rays of a double Order round the Style of a purple Colour, the lower Row being the longest. In the Center of this arises the Pillar-like Style, with the roundish Germen at the Top, surrounded at the Bottom, where it adheres to the Style, with 5 flattish Stamina which spread out every Way, and sustain each of them an oblong Summit which hangs downward, and on their under Side are covered with a yellow Farina. The Flowers have an agreeable Scent, but are of a short Duration, opening in the Morning, and fade away in the Evening, never opening again, but are succeeded by fresh Flowers, which come out at the Joints of the Stalk above them. When the Flowers fade, the roundish Germen swells to a Fruit as large as a middling Apple, which changes to a pale Orange Colour when ripe, inclosing many oblong rough Seeds inclosed in a sweetish Pulp.

This Sort is usually propagated by Seeds, which are brought from *America*, for the Seeds do not often ripen in *England*; though I have sometimes had several Fruit perfectly ripe, on Plants which were plunged in a Tan Bed under a deep Frame; but those Plants, which are exposed to the open Air, do not produce Fruit here. The Seeds should be sown on a moderate hot Bed, which will bring up the Plants much sooner than when they are sown in the open Air, so they will have more Time to get Strength before Winter. When the Plants are come up 2 or 3 Inches high, they should be carefully taken up, and each planted in a separate small Pot filled with good Kitchen Garden Earth, and plunged into a moderate hot Bed to forward their taking new Root; after which they should be gradually inured to bear the open Air, to which they should be exposed in Summer, but in Autumn they must be placed under a Frame to screen them from the Frost; but they should have the free Air at all Times in mild Weather. The Spring following some of these Plants may be turned out of the Pots, and planted in a warm Border, where, if they are covered with Tanners Bark every Winter to keep out the Frost, they will live several Years, their Stalks decaying in Autumn and new ones arise in the Spring, which in warm Seasons will

flower very well. If those Plants which are continued in Pots, are plunged into a Tan Bed, some of them may produce Fruit; and, if the Stalks of these are laid down into Pots of Earth plunged near them, they will take Root, so that the Plants may be easily propagated this Way.

The 2d Sort has not been many Years in *England*, but is now the most common. This grows naturally in the *Brasils*, yet is hardly enough to thrive in the open Air here, and is seldom injured except in very severe Winters, which commonly kills the Branches to the Ground, and sometimes destroys the Roots; this rises in a few Years to a great Height, if they have proper Support. I have seen some of these Plants, whose Branches were trained up more than forty Feet high. The Stalks will grow almost as large as a Man's Arm, and are covered with a purplish Bark, but do not become very woody. The Shoots from these Stalks are often 12 or 15 Feet long in one Summer; they are very slender, so must be supported, otherwise they will hang to the Ground, intermix with each other, and appear very unsightly. These are garnished at each Joint with one Hand-shaped Leaf, composed of 5 smooth entire Lobes, the middle one, which is the longest, being almost 4 Inches long, and one broad in the Middle, the other are gradually shorter, and the 2 outer Lobes are frequently divided on their outer Side into 2 smaller Lobes or Segments. Their Foot Stalks are near 2 Inches long, and have 2 small Leaves or Ears embracing the Stalks at their Base, and from the same Point comes out a long Clasper, which twists round the neighbouring Support, whereby the Stalks are supported. The Flowers come out at the same Joints as the Leaves; these have Foot Stalks almost 3 Inches long. The Flowers have an outer Cover composed of 3 concave oval Leaves of a paler green than the Leaves of the Plant, which are little more than half the Length of the Empalement, which is composed of 5 oblong blunt Leaves of a very pale green; within these are 5 Petals, nearly of the same Shape and Size with the Empalement, standing alternately between them. In the Center of the Flower arises a thick Club-like Column about an Inch long, on the Top of which sits an oval Germen, from whose Base spreads out 5 Awl-shaped horizontal Stamina, which are terminated by oblong broad Summits fastened in the Middle to the Stamina hanging downward; these may be moved round without separating from the Stamina, and their under Surface is charged with yellow Farina; on the Side of the Germen, arise 3 slender purplish Styles near an Inch long, spreading from each other, terminated by obtuse Stigmas. Round the Bottom of the Column are 2 Orders of Rays, the inner, which is the shortest, inclines upward to the Column, the outer, which is near half the Length of the Petals, spreads open flat upon them; these Rays are composed of a great Number of Thread-like Filaments of a purple Colour at Bottom, but are blue on the Outside. These Flowers have a faint Scent, and continue but one Day; after they fade, the Germen on the Top of the Column swells to a large oval Fruit about the Size and Shape of the *Mogul* Plum, and when ripe is of the same pale yellow Colour, inclosing a sweetish disagreeable Pulp, in which are lodged oblong

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oblong Seeds. This Plant begins to flower early in July, and there is a Succession of Flowers daily, till the Frost in Autumn puts a Stop to them.

It may be propagated by Seeds, which should be sown in the same Manner as those of the first Sort, and the Plants treated in the same Way till the following Spring, when they should be turned out of the Pots, and planted against a good aspected Wall, where they may have Height for their Shoots to extend, otherwise they will hang about and entangle with each other, so make but an indifferent Appearance; but where Buildings are to be covered, this Plant is very proper for the Purpose. After they have taken good Root in their new Quarters, the only Care they will require, is to train their Shoots up against the Wall, as they extend in Length, to prevent their hanging about, and if the Winter proves severe, the Surface of the Ground about their Roots should be covered with Mulch to keep out the Frost, and if the Stalks and Branches are covered with Mats, Peas Haulm, Straw, or any such light Covering, it will protect them in Winter; but this Covering must be taken off in mild Weather, otherwise it will cause the Branches to grow mouldy, which will be more injurious to them than the Cold. In Spring the Plants should be trimmed, when all the small weak Shoots should be entirely cut off, and the strong ones shortened to about four or five Feet long, which will cause them to put out strong Shoots for flowering the following Year.

This Plant is also propagated by laying down the Branches, which in one Year will be well rooted, so may be taken off from the old Plants and transplanted, where they are designed to remain. The Cuttings of this will also take Root, if they are planted in a loamy Soil not too stiff, in the Spring before they begin to shoot. If these are covered with Bell or Hand Glasses to exclude the Air, they will succeed much better than when they are otherwise treated; but when the Cuttings put out Shoots, the Air should be admitted to them, otherwise they will draw up weak and spoil, and they must be afterward treated as the Layers.

Those Plants, which are propagated by Layers or Cuttings, do not produce Fruit so plentifully as the Seedling Plants, and I have found the Plants, which have been propagated two or three Times, either by Layers or Cuttings, seldom produce Fruit, which is common to many other Plants.

If in very severe Winters the Stalks are killed to the Ground, the Roots often put out new Stalks the following Summer, therefore they should not be disturbed; and where there is Mulch laid on the Ground about their Roots, there will be little Danger of their being killed, although all the Stalks should be destroyed.

There is a Variety of this; the Lobes of the Leaves are much narrower, and are divided almost to the Bottom. The Flowers come later in the Summer; the Petals of the Flowers are narrower, and of a purer white, but I believe it is only a feminal Variation of the other, so not worthy of being enumerated.

The 3d Sort grows naturally in *Virginia* and *Jamaica*; this hath a perennial creeping Root, sending up many weak Stalks about 3 or 4 Feet high, which are garnished with Leaves shaped very like those of Ivy, and are

almost as large, but of a pale green and very thin Consistence. The Flowers come out from the Wings of the Stalk upon slender Foot Stalks an Inch and a Half long, and at their Base arise very slender Tendrils, which clasp round any neighbouring Support. The Flowers are of a dirty yellow Colour, and not larger than a Sixpence when expanded, so make no great Appearance. This may be propagated by its creeping Roots, which may be parted in April, and planted where they are to remain. This Sort will live in a warm Border, if treated as is directed for the first Sort. Some of these Plants lived many Years in the *Chelsea* Garden in a Border to a South-West Aspect, but in the Year 1740 they were killed by the Frost.

The 4th Sort grows naturally in *Jamaica*; this hath a perennial Root, from which arise several slender Stalks 4 or 5 Feet high, which have Joints 4 or 5 Inches asunder; at each of these come out one Leaf, a Tendril, and a Flower. The Leaves have 3 Lobes; the Middle one is 3 Inches long, and almost an Inch broad in the Middle; the 2 side Lobes are about 2 Inches long, and 3 Quarters of an Inch broad, of a light green Colour, and thin. The Flowers are smaller than those of the last mentioned, and are of a greenish Colour; these are succeeded by oval Fruit, about the Size of small Olives, which turn purple when they are ripe.

The 5th Sort grows naturally in the *West-India* Islands; this rises with a weak Stalk to the Height of 20 Feet. As the Stalks grow old, they have a thick fungous Bark, like that of the Cork Tree, which cracks and splits. The smaller Branches are covered with a smooth Bark, and garnished with smooth Leaves at each Joint, sitting upon very short Foot Stalks; these have 3 Lobes, the middle one being much longer than those on the Sides, so that the whole Leaf has the Form of the Point of those Halberds used by the Yeomen of the Guards. The Flowers are small, of a greenish yellow Colour, and are succeeded by small oval Fruit of a dark purple when ripe.

The 6th Sort grows naturally in the *West-Indies*; this hath a perennial Root, from which arise several slender Stalks, which rise 8 or 10 Feet high, garnished with smooth green Leaves standing on slender Foot Stalks. These are but slightly indented into 3 Lobes, which end in acute Points, and are shaped like the Points of Halberds, the middle one standing obliquely to the Foot Stalk. The Flowers come out from the Wings of the Leaves on very short Foot Stalks; they are of a pale yellow. The Petals of the Flowers are very narrow, and longer than those of the 2 former Sorts; the Fruit is smaller and of an oval Form, changing to a dark purple when ripe.

The 7th Sort grows naturally in most of the Islands in the *West-Indies*, where the Inhabitants call it Love in a Mist. The Root is annual; the Stalks rise 5 or 6 Feet high when supported; they are channeled and hairy. The Leaves are Heart-shaped, divided into 3 Lobes, the middle Lobe being 3 Inches long, and one and a Half broad, the 2 side Lobes are short but broad; they are covered with short brown Hairs. The Tendrils come out at the same Place as the Leaves, as do also the Flowers whose Foot Stalks are 2 Inches long,

long, hairy, and pretty strong. The Empalement of the Flower is composed of slender hairy Filaments, which are wrought like a Net; these are longer than the Petals of the Flower, and turn up round them, so that the Flowers are not very conspicuous at a Distance. They are white, and of short Duration; their Structure is the same with the other Sorts, and they are succeeded by roundish oval Fruit about the Size of an ordinary Golden Pippin, of a yellowish green Colour, inclosed with a netted Empalement. This Plant is propagated by Seeds, which should be sown upon a hot Bed early in Spring, and when the Plants are fit to remove, they should be each transplanted into a small Pot filled with light Kitchen Garden Earth, and plunged again into a hot Bed, observing to shade them from the Sun, till they have taken new Root; after which they must be treated as other Plants from the same Country, shifting them into larger Pots as their Roots increase; and when the Plants are too tall to remain under the Glasses of the hot Bed, they should be removed into an airy Glass Case, where they should have the free Air admitted to them in warm Weather, but screened from the Cold. In this Situation the Plants will flower in July, and their Seeds will ripen in the Autumn. The whole Plant has a disagreeable Scent when touched.

There is a Variety of this, if it is not a distinct Species, with hairy Leaves not so broad as those of the former. The whole Leaf is shaped more like the Point of a Halberd, and those Leaves which grow toward the upper Part of the Stalks, have very small Indentures, so approach near to simple Leaves without Lobes. The Flowers are also smaller, but of the same Form, and the Roots are of shorter Duration, so that I am inclined to believe it is a distinct Species.

The 8th Sort has some Appearance of the 7th, so that many Persons have supposed it was only an accidental Variety, but there can be no Doubt of its being a different Species. The Stalks of this rise upward of 20 Feet high, and will continue 2 or 3 Years; the Leaves are larger, but of the same shape, and hairy; the Tendrils of this are very long, as are also the Foot Stalks of the Flowers, which are smooth, not hairy as the former; the Empalement of the Flowers is netted, but not so long as in the former Sort; the Flowers are larger, and the Rays of a light blue; the Fruit is much less and rounder than those of the other, and when ripe changes to a deep yellow Colour.

The 9th Sort grows naturally at *La Vera Cruz*; this is a perennial Plant. The Stalks rise 20 Feet high, dividing into many slender Branches, covered with a soft hairy Down. The Leaves are shaped like the Point of a Halberd; they are 3 Inches long, and one Inch and a Half at their Base, of a light green, and are soft and silky to the Touch, standing obliquely to the Foot Stalks. The Flowers come out at the Wings of the Leaves like the other Species; these are not half so large as those of the 2d Sort, but are of the same Form. The Petals are white, and the Rays or Filaments purple with a Mixture of yellow. The Fruit is small, roundish, and yellow when ripe.

The 10th Sort grows naturally in *Jamaica*, from whence the late Dr. *Houssoun* sent the Seeds to England;

this is a perennial Plant. The Stalks are slender, and rise 20 Feet high when they are supported, and divide into many weak Branches; the Leaves, Flowers, and Tendrils come out at each Joint. The Leaves are 4 Inches long, and 3 broad, rounded at their Base in Form of a Heart, but end at their Points with 2 Horns, which in some Leaves are more acute than in others, several of them appearing as if they were cut a little hollow at the Top, like the Leaves of the Tulip Tree. They have 3 longitudinal Veins, which join at the Base of the Leaf to the Foot Stalk, but the 2 outer diverge toward the Borders of the Leaf in the Middle, drawing inward again at the Top. The Leaves are of a deep green on their upper Side, but pale on their under, and stand on short Foot Stalks; the Foot Stalks of the Flowers are very slender, of a purplish Colour, about an Inch and a Half long. The Flowers are shaped like those of the other Species, but when expanded are not more than an Inch and a Half Diameter, of a soft red Colour, and little Scent. The Fruit is small, oval, and, when ripe, changes to a purple Colour.

The 11th Sort was discovered by Mr. *Robert Millar* growing naturally near *Carthage* in *New Spain*. This hath slender striated Stalks of a brownish red Colour, dividing into many slender Branches, garnished with Leaves shaped like the Wings of a Bat when extended; they are about 7 Inches in Length, measuring from the two extended Points, which may rather be termed the Breadth, for from the Base to the Top they are not more than 2 Inches and a Half. The Foot Stalk is set half an Inch from the Base of the Leaf, from which come out 3 Ribs or Veins; two of them extend each Way to the two narrow Points of the Leaf, the other rises upright to the Top, where is the greatest Length of the Leaf, if it may be so termed. The Figure of this Leaf is the most singular of any I have yet seen: The Flowers come out at the Joints of the Stalk, on short slender Foot Stalks; they are about 3 Inches Diameter when expanded. The Petals and Rays are white; the Rays are twisted and slender, extending beyond the Petals. The Fruit of this I have not seen entire.

The 12th Sort was discovered by Dr. *Houssoun*, growing naturally at *La Vera Cruz* in *New Spain*. This hath slender angular Stalks, which rise 20 Feet high, sending out many Branches, garnished with Moon-shaped Leaves, and have 2 blunt Lobes, spreading asunder each Way, so as to have the Appearance of a half Moon. The Flowers and Tendrils come out from the same Joints of the Stalks. The Flowers are of a pale Colour and small, but shaped like those of the other Sorts; these are succeeded by oval Fruit of a purple Colour, about the Size of small oval Grapes.

The 13th Sort has some Resemblance of the 12th, but the Stalks are rounder and become ligneous. The Leaves are almost as stiff as those of the Bay Tree, and are not so deeply divided as those of the former. The Flowers stand on long Foot Stalks, which are horizontal; they are small, white, and shaped like those of the other Sort. The Fruit is oval, small, and of a purple Colour, sitting close to the Petals of the Flowers, which are permanent. This was discovered growing naturally at *Carthage* in *New Spain*.

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The 14th Sort grows naturally in the Islands of the *West-Indies*; this is by *Tournefort* separated from this Genus, and titled by him *Murucua*, which is the *Brasilian* Name for this, and some of the other Species. It hath slender climbing Stalks, which are channelled, putting out Tendrils at the Joints, which fasten themselves about the neighbouring Plants for Support, and climb to the Height of 10 or 12 Feet; they are garnished with Leaves cut into 2 Lobes at their Base, but at the Top are only a little hollowed at a Distance from each Point, rising again in the Middle opposite the Foot Stalk. The Base of the 2 Lobes spread and meet, so they appear as if they embraced the Stalk, but when viewed near, they are found divided to the short crooked Foot Stalk, which scarcely appears. There are 2 purplish Veins arising from the Foot Stalk, which extend each Way to the Points of the Lobes. The Leaves are of a lucid green on their upper Surface, but pale on their under; the Tendrils, which come out with the Leaves are very long, tough, and of a purple Colour. The Flowers are produced toward the End of the Branches, coming out by Pairs on each Side the Branches; these have purple Foot Stalks an Inch and a Half long, sustaining one Flower at the Top, whose Empalement is composed of 5 purple Leaves, which form a Kind of Tube, and within are 5 very narrow purple Petals. The Column in the Center of the Flower is of the same Length as the Petals, but the Stamina are extended an Inch above. When the Flowers fade, the Germen swells to an oval purple Fruit, the Size of the small red Gooseberry, inclosing a soft Pulp, in which are lodged the Seeds.

The 15th Sort grows naturally in the *West-Indies*, where the Inhabitants call it *Granadilla*; the Fruit of this Sort is commonly eaten there, being served at Table in Deserts. This hath a thick, climbing, herbaceous, triangular Stalk, sending out slender Tendrils at each Joint, which fasten to the Bushes and Hedges for Support, rising to the Height of 15 or 20 Feet, garnished at each Joint with one large, oval, Heart-shaped Leaf 6 Inches long, and 4 broad in the Middle, indented at the Base, where the short Foot Stalk is fastened to the Branches, round at the Top, having an acute Point. There are 2 large Stipulæ or Ears joined to the Stalks, which encompass the Foot Stalks of the Flowers and Leaves, as also the Base of the Tendril. The Leaves are of a lively green, and thin Texture, having one strong Nerve or Mid-rib running longitudinally, from which arise several small Veins, which diverge to the Sides, and incurve again toward the Top. The Flowers stand on long Foot Stalks, which have 2 small Glandules in the Middle; the Cover of the Flower is composed of 3 soft velvety Leaves, of a pale red with some Stripes of a lively red Colour; the Petals of the Flower are white, and the Rays blue. These Flowers are large, so make a fine Appearance during their Continuance; they are like the other Species, of short Duration, but there is a Succession of Flowers for some Time on the Plants. After the Flowers are past, the Germen swells to a roundish Fruit, the Size of a middling Apple, of a yellow Colour when ripe, having a thicker Rind than any of the other Sorts inclosing a sweetish Pulp, in which are lodged many oblong flat

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Seeds of a brownish Colour, a little rough to the Touch.

The 16th Sort grows naturally in the *West-Indies*; this hath climbing tough Stalks, which put out Claspers at every Joint like the others, which fasten to the neighbouring Trees and Hedges for Support, and rise upward of 20 Feet high, sending out many Side Branches. The Leaves are 4 or 5 Inches long, and 2 broad, of a pretty thick Consistence, and a bright green on their upper Side, but pale on their under. The Flowers come out at the Joints of the Stalks, upon Foot Stalks, an Inch and a Half long; the Buds of the Flowers are as large as Pigeons Eggs, before they begin to expand. The Cover of the Flower is composed of 3 large, oval, green Leaves, which are indented on their Edges, and hollowed like a Spoon; within these is the Empalement of the Flower, which is composed of 5 oblong Leaves, of a pale green on their Outside, but whitish within; these are about an Inch and a Half long, and half an Inch broad. The Petals of the Flower are white, and stand alternately with those of the Empalement, but are not more than half their Breadth, and are marked with several small, brownish, red Spots. The Rays of the Flower are of a Violet Colour; the Column in the Center is yellowish, as is also the round Germen at Top, but the 3 Styles are of a purple Colour. These Flowers have an agreeable Odour, and, when they fade, the Germen swells to the Size of a Pullet's Egg, and nearly of the same Shape, which turns yellow when ripe. The Rind is soft and thick; the Pulp has an agreeable acid Flavour, which quenches Thirst, abates the Heat of the Stomach, gives an Appetite, and recruits the Spirits, so is commonly given in Fevers. The Seeds are Heart-shaped and brownish.

The 17th Sort grows naturally in the *Babama* Islands, from whence the late Mr. *Catesby* sent the Seeds to *England*; this hath slender climbing three cornered Stalks, which send out Tendrils at each Joint, fastening themselves to any neighbouring Support. The Stalks climb to the Height of 12 or 14 Feet, and are garnished with oblong oval Leaves about two Inches long, and one broad, of a light green, and entire. Their Foot Stalks are slender, and an Inch long, from which arise 3 longitudinal Veins, one running through the Middle of the Leaf, the other 2 diverge to the Sides, drawing toward each other again at the Point. The Flowers come out from the Wings of the Stalk upon slender Foot Stalks an Inch long; the Empalement of the Flower is composed of five oblong, narrow, purplish Leaves, and within are five narrower Petals of the same Colour, which turn backward after they have been some Time expanded. The Column in the Middle of the Flower is very long and slender, supporting a round Germen, from whose Base spread out 5 slender Stamina, terminated by oblong hanging Summits, and from the Top of the Germen arise 3 slender Styles, which spread afunder, and are crowned by roundish Summits. When the Flowers fade, the Germen swells to an oval Fruit, about the Size of a Sparrow's Egg, which changes to a purple Colour when ripe, filled with oblong Seeds inclosed in a soft Pulp.

The 19th Sort was discovered by the late Dr. *Houftoun* at *La Vera Cruz* in *New Spain*, where it grows naturally

turally from whence he sent the Seeds in 1731 to *England*, which succeeded in several Gardens. This hath slender climbing Stalks, sending out many small Branches, which climb to the Height of 25 or 30 Feet, when they meet with Support, to which they fasten themselves by their Tendrils. The Stalks by Age become ligneous toward the Bottom; their Joints are not far asunder. The Leaves stand upon short slender Foot Stalks; they are 3 Inches and a Half long, and two broad in the Middle, rounded at their Base, but terminate in a Point at the Top; they are smooth, entire, and of a lively green Colour. The Flowers come out from the Wings of the Leaves, standing on long Foot Stalks; the Empalement of the Flower is composed of 5 oblong Leaves, green on their Outside, but whitish within. The Flower has 5 oblong white Petals situated alternately to the Leaves of the Empalement, which spread open; the Rays are of a bluish purple Colour, inclining at Bottom to red; the Column in the Center is short and thick; the Germen on the Top is oval, and, after the Flowers fade, swells to the Size of a Pullet's Egg, and changes to a pale yellow when ripe, having many oblong Seeds inclosed in a soft Pulp. The Flowers of this Kind have an agreeable Odour, but are of short Duration, seldom continuing 20 Hours open; but there is a Succession of Flowers on the Plants, from *June* to *September*, and sometimes the Fruit will ripen here.

All these perennial Sorts which are Natives of the hot Parts of *America*, require a Stove to preserve them here, without which they will not thrive; for although some of the Sorts will live in the open Air during the warm Months in Summer, yet they make but little Progress; nor will the Plants produce many Flowers, unless the Pots in which they are planted, are plunged into the Tan Bed of the Stove, and their Branches trained against an Espalier. The best Way to have them in Perfection, is to make a Border of Earth on the Back-side of the Tan Bed, which may be separated by Planks to prevent the Earth from mixing with the Tan; and when the Plants are strong enough, they should be turned out of the Pots, and planted in this Border; adjoining to which, should be a Trellis erected to the Top of the Stove; against this the Stalks of the Plants must be trained, and as they advance they will form a Hedge to hide the Wall of the Stove, and their Leaves continuing green all the Year, together with their Flowers which will be plentifully intermixed in Summer, will have a very agreeable Effect.

As there will be only a Plank Partition between the Earth and the Tan, the Earth will be kept warm by the Tan Bed, which will be of great Service to the Roots of the Plants. This Border should not be less than 2 Feet broad and 3 deep, which is the usual Depth of the Pit for Tan; so that where these Borders are intended, the Pits should not be less than 8 Feet broad, that the Bark Bed exclusive of the Border, may be six Feet wide. If the Border is fenced off with strong Ship Planks, they will last some Years, especially if they are well painted over with a Composition of melted Pitch, Brickdust and Oil, which will preserve them sound a long Time; and the Earth should be taken out carefully from between the Roots of the Plants, at least once a Year, putting in fresh; with this Management, I have seen them in great Perfection. But where there

has not been this Conveniency, I have turned the Plants out of the Pots, and planted them in the Tan when it was half rotten, in which they have rooted exceedingly, and have thriven for 2 or 3 Years as well as could be desired; but when their Roots extended to a great Distance in the Bed, they have been injured by renewing the Bark; and when it has fermented violently, the Roots have been scalded, and the Plants killed, so the other Method is more eligible.

These Plants are propagated by Seeds sown on a good hot Bed in Spring, and when the Plants are fit to remove, they should be each planted in a small Pot filled with good Kitchen Garden Earth, and plunged into a Tan Bed, observing to shade them from the Sun till they have taken new Root, then they must be treated like other tender Plants from the same Countries. When they are too high to remain under the Glasses of the hot Bed, they should be turned out of the Pots and planted in the Stove, in the Manner before-mentioned.

As these Sorts do not often perfect Seeds here, they may be propagated by laying down their Branches in *April*, and they will put out Roots by the Middle of *August*, when they may be separated from the old Plants, and either planted in Pots to get Strength, or into the Border of the Stove, where they are to remain.

Some of these Sorts may be propagated by Cuttings; these should be planted in Pots, about the End of *March*, and plunged into a moderate hot Bed, observing to screen them from the Sun, and refresh them with Water gently, as often as the Earth may require it; in about 2 Months or 10 Weeks, they will put out Roots, and may then be treated as the seedling Plants.

PASSION FLOWER. See *Passiflora*.

PASTINACA. *Tourn. Inst. R. H.* 319 *Tab.* 170. *Lin. Gen. Plant.* 324. Parsnep; in *French, Panais*.

The Characters are,

It hath an umbellated Flower; the principal Umbel is composed of many smaller, and these are likewise composed of several Rays. They have no Involucrum, and the Empalement is scarce visible; the Umbel is uniform. The Flowers have 5 Spear-shaped incurved Petals, and 5 Hair-like Stamina, terminated by roundish Summits. The Germen is situated under the Flower, supporting 2 reflexed Styles crowned by obtuse Stigmas. The Germen becomes an elliptical, plain, compressed Fruit, dividing in 2 Parts, having 2 bordered elliptical Seeds.

The Species are,

1. PASTINACA foliis simpliciter pinnatis hirsutis. Parsnep with single, winged, hairy Leaves. This is the *Pastinaca sylvestris latifolia* B. C. P. 155. Broad-leaved wild Parsnep.

2. PASTINACA foliis simpliciter pinnatis glabris. Parsnep with single winged smooth Leaves. This is the *Pastinaca sativa, latifolia* C. B. P. 155. Broad-leaved Garden Parsnep.

3. PASTINACA foliis decompositis pinnatis Hort. Cliff. 105. Parsnep with decomposed winged Leaves. This is the *Pastinaca sylvestris altissima*. *Tourn. Inst.* 319. Tallest wild Parsnep, by *Casper Baubin* titled *Panax Costinum*. *Pin.* 156.

The 1st Sort grows naturally on the Side of Banks, and on dry Land in many Parts of *England*. This is a biennial Plant, the first Year shooting out Leaves which spread

spread on the Surface of the Ground; these are singly winged, the Lobes irregularly cut, and the Leaves hairy. The following Year the Stalks rise 4 or 5 Feet high, they are channelled, hairy, and garnished with winged Leaves like those at Bottom, but smaller; the Stalk branches out toward the Top, each Branch being terminated by a large Umbel of yellow Flowers; these are succeeded by compressed Fruit, having two flat bordered Seeds. The Plant flowers in *June*, and the Seeds ripen in *August*.

The Root and Seed of this is sometimes used in Medicine, but seldom cultivated in Gardens, the Markets being supplied from the Fields; yet the Druggists commonly sell the Seeds of the Garden Kind for it, which they may purchase at an easy Price when it is too old to grow, but then the Seeds can have no Virtue left.

The 2d Sort hath smooth Leaves, of a light or yellowish green Colour, in which this differs from the former; the Stalks rise higher and are deeper channelled; the Foot Stalks of the humbles are much longer, and the Flowers of a deeper yellow Colour. These two Sorts have been thought only Varieties, the Garden Parsnep they have supposed to differ from the wild only by Culture; but I have cultivated both many Years, and have never found that either of the Sorts have varied; the Seeds of each having constantly produced the same Sort they were taken from, so that I am certain they are distinct Species.

This Sort is cultivated in Kitchen Gardens, the Roots are large, sweet, and accounted very nourishing. They are propagated by Seeds sown in *February* or *March*, in a rich mellow Soil, which must be well dug, that their Roots may run downward, the greatest Excellency being the Length and Bigness of the Roots. These may be sown alone, or with Carrots, as practised by the Kitchen Gardeners near *London*; some of whom also mix Leeks, Onions, and Lettuce, with their Parsneps; but this I think very wrong, for it is not possible, that so many different Sorts can thrive well together, except they are allowed a considerable Distance; and if so, it will be equally the same to sow the different Sorts separate. However, Carrots and Parsneps may be sown very well, especially where the Carrots are designed to be drawn off very young; because the Parsneps generally spread most towards the latter End of Summer, which is after the Carrots are gone, so there may be a double Crop on the same Ground.

When the Plants are up, hoe them, leaving them about ten Inches or a Foot asunder; observing at the same Time to cut up all the Weeds, which, would soon overbear the Plants and choke them. This must be repeated 3 or 4 Times in the Spring, as you find the Weeds grow; but in the latter Part of Summer, when the Plants are so strong as to cover the Ground, they will prevent the Growth of Weeds, and after that Season will require no farther Care.

When the Leaves begin to decay, the Roots may be dug up for Use, before which Time they are seldom well tasted; nor are they good for much late in the Spring; after they are shot out again; so that those who would preserve these Roots for Spring Use, should dig them up in the Beginning of *February*, and bury them in Sand, in a dry Place, where they will remain good until the middle of *April*, or later.

If you intend to save the Seeds of this Plant you should make Choice of some of the longest, straightest and largest Roots, which should be planted about 2 Feet asunder, in some Place where they may be defended from the strong South and West Winds; for the Stems of these Plants commonly grow to a great Height, and are very subject to be broken by strong Winds if exposed thereto; they should be constantly kept clear from Weeds, and if the Season should prove very dry, give them some Water twice a Week, which will cause them to produce a greater Quantity of Seeds; and much stronger than if they were wholly neglected. Toward the latter End of *August* or the Beginning of *September*, the Seeds will be ripe; at which Time you should carefully cut off the Heads, and spread them upon a coarse Cloth for 2 or 3 Days, to dry; after which, the Seeds should be beaten off, and put up for Use; but you must never trust to these Seeds after they are a Year old, for they seldom grow beyond that Age.

The Leaves of the Garden Parsnep are dangerous to handle, especially in a Morning, while the Dew remains upon them, at which Time, if they are handled by Persons who have a soft Skin, it will raise it in Blisters. I have known some Gardeners, when they have been drawing up Carrots from among Parsneps in a Morning, when their Leaves were wet with Dew, they have drawn their Sleeves of their Shirts up to their Shoulders, to prevent their being wet; by doing which they had their Arms, so far as they were bare, covered over with large Blisters, full of a scalding Liquor, which proved very troublesome for several Days.

The 3d Sort rises with a green rough Stalk 7 or 8 Feet high, garnished with large decomposed winged Leaves, very rough to the Touch, and of a dark green Colour; the Juice is very yellow, which flows out where either the Leaf or Stalk is broken; the Stalks are divided upward into many horizontal Branches, each being terminated by a large Umbel of yellow Flowers. These appear in *July*, and are succeeded by plain Seeds, bordered, and a little convex in the Middle, which ripen in Autumn. The *Opapanax* of the Shops, is thought to be the concrete Juice of this Plant.

PASTURE.

Pasture Ground is of two Sorts: The one is low Meadow Land which is often overflowed, and the other is Upland, which lies high and dry. The first of these will produce a much greater Quantity of Hay than the latter, and will not require manuring or Dressing so often; but then the Hay produced on the Upland is much preferable, and the Meat which is fed in the Upland more valued than that which is fatted in rich Meadows; though the latter will make the fatter and larger Cattle, as is seen by those which are brought from the low rich Lands in *Lincolnshire*. But where People are nice in their Meat, they will give a much larger Price for such as hath been fed on the Downs, or in short Upland Pasture, than for the other, which is much larger. Besides this, dry Pastures have an Advantage over the Meadows, that they may be fed all the Winter, and are not so subject to poach in wet Weather; nor will there be so many bad Weeds produced, which are great Advantages, and do, in a great Measure, recompense for the Smallness of the Crop.

Having already mentioned the Advantages of Meadow Land; or such as is capable of being overflowed with Water, and given Directions for draining and improving low Pasture, under the Article of *Land*; I shall not repeat what is there said here, but shall just mention some Methods of improving Upland Pasture.

The first Improvement of Upland Pasture is, by fencing it, and dividing it into small Fields of 4, 5, 6, 8, or 10 Acres each, planting Timber Trees in the Hedge Rows; these will screen the Grass from the drying pinching Winds of *March*, which prevent it from growing in large open Lands; so that if *April* proves a cold dry Month, the Land produces very little Hay, whereas in the sheltered Fields the Grass will begin to grow early in *March*, and will cover the Ground, and prevent the Sun from parching the Roots of it, whereby it will keep growing, so as to afford a tolerable Crop, if the Spring should prove dry. But in fencing Land, it must be observed (as was before directed) not to make the Inclosures too small, especially where the Hedge Rows are planted with Trees; because when the Trees are advanced to a considerable Height, they will spread over the Land; and, where they are close, will render the Grass four; so that instead of being an Advantage, it will greatly injure the Pasture.

The next Improvement of Upland Pastures is, to make the Turf good, where either from the Badness of the Soil, or want of proper Care, the Grass hath been destroyed by Rushes, Bushes, or Mole Hills. Where the Surface is clayey and cold, it may be improved by paring it off, and burning it as directed under the Article of *Land*; but if it is a hot sandy Land, then Chalk, Lime, Marle, or Clay, are very proper Manures to lay upon it; but this should be laid in good Quantities, otherwise it will be of little Service.

If the Ground is over-run with Bushes or Rushes, it will be of great Advantage, to grub them up toward the latter Part of the Summer; and after they are dried to burn them, and spread the Ashes over the Ground just before the autumnal Rains; at which Time the Surface of the Land should be levelled, and sown with Grass Seed, which will come up in a short Time, and make good Grass the following Spring. So, where the Land is full of Mole Hills, they should be pared off and burnt for the Ashes, or spread immediately on the Ground, when pared off, observing to sow the bare Patches with Grass Seed, just as the autumnal Rains begin.

Some Pasture Lands are full of Ant Hills, which are not only disagreeable to the Sight, but where they are in any Quantity, the Grass cannot be mowed; therefore the Turf which grows over them, should be divided with an Instrument into 3 Parts, and pared off each Way; then the Middle or Core of the Hills should be dug out and spread over the Ground, leaving the Holes open all the Winter to destroy the Ants; in Spring the Turf may be laid down again, and after the Roots of the Grass are settled again in the Ground, it should be rolled to settle the Surface, and make it even. This, if properly managed, will be a great Improvement.

Where Land has been thus managed, it will be of great Service to roll the Turf, in *February* and *March*, with a heavy Wood Roller, always observing to do it in moist Weather, that the Roll may make an Impression:

This will render the Surface level, and make it much easier to mow the Grass, than when the Ground lies in Hills; it will also cause the Turf to thicken, so as to have what the People term a goot Bottom. The Grass likewise will be the sweeter for this Husbandry, and it will be a great Help to destroy bad Weeds.

Another Improvement of Upland Pastures is the feeding them every other Year; for where this is not practised, the Land must be manured at least every third Year; and where a Farmer hath much arable Land in his Possession, he will not care to part with his Manure to the Pasture. Therefore every Farmer should endeavour to proportion his Pasture to his arable Land, especially where Manure is scarce, otherwise he will soon find his Error; for the Pasture is the Foundation of all the Profit, which may arise from the arable Land.

When the Upland Pastures are mended by Manure, a Regard should be had to the Nature of the Soil, and a proper Sort of Manure applied: As for Instance; All hot sandy Lands should have a cool Manure; Neats Dung and Swines Dung are very proper for such Lands, as are also Marle and Clay; but for cold Lands, Horse Dung, Ashes, or Sand, and other warm Manures, are proper; these should be applied in Autumn, before the Rains have soaked the Ground, and rendered it too soft to cart on; it should be carefully spread, breaking all the Clods as small as possible, and early in the Spring harrowed with Bushes, to let it down to the Roots of the Grass. When Manure is laid on at this Season, the Rains in Winter will wash down the Salts, so that the following Spring the Grass will receive the Advantage of it.

Great Care should be taken to destroy Weeds in the Pasture, every Spring and Autumn; where this is not practised, the Weeds will ripen their Seeds, which will spread over the Ground, and thereby fill it with such a Crop as will soon over-bear the Grass, and destroy it; and it will be very difficult to root them out, after they have got Possession; especially Ragwort, Hawkweed, Dandelion, and such other Weeds as have Down adhering to their Seeds.

These Upland Pastures seldom degenerate the Grass which is sown on them, if the Land is tolerably good; whereas the low Meadows, which are overflowed in Winter, in few Years turn to a harsh rushy Grass, though the Upland will continue a fine sweet Grass for many Years without renewing.

There is no Part of Husbandry, of which the Farmers are in general more ignorant, than that of Pasture; most of them suppose, that when an old Pasture is ploughed up, it can never be brought to have a good Sward again; so their common Method of managing their Land after ploughing, and getting 2 or 3 Crops of Corn is, to sow with their Crop of Barley, some Grass Seeds (as they call them); that is, either the red Clover, which they intend to stand 2 Years after the Corn is taken off the Ground, or Rye Grass mixed with Trefoil; but as all these are at most but biennial Plants, whose Roots decay soon after their Seeds are perfected, so the Ground having no Crop upon it, is again ploughed for Corn; and this is the constant Round which the Lands are employed in, by the better Sort of Farmers; I never have met with one who had the least Notion

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of laying down their Land to Grass for any longer Continuance; therefore the Seeds which they usually sow, are best adapted for this Purpose.

But whatever may have been the Practice of these People, I hope to prove, that it is possible to lay down Land, which has been in Tillage, with Grass, in such Manner that the Sward shall be as good, if not better, than any natural Grass, and of as long Duration. But this is never to be expected, in the common Method of sowing a Crop of Corn with the Grass Seeds; for wherever this hath been practised, if the Corn has succeeded well, the Grass has been very poor and weak; so that if the Land has not been very good, the Grass has scarcely been worth standing; for the following Year it has produced but little Hay, and the Year after the Crop is worth little, either to mow or feed. Nor can it be expected it should be otherwise, for the Ground cannot nourish 2 Crops; and if there were no Deficiency in the Land, yet the Corn being the first, and most vigorous of Growth, will keep the Grass from making any considerable Progress; so that the Plants will be extremely weak and but very thin, many of them which came up in the Spring being destroyed by the Corn; for where-ever there are Roots of Corn, it cannot be expected there should be any Grass. Therefore the Grass must be thin, and, if the Land is not in good Heart, to supply the Grass with Nourishment, that the Roots may branch out after the Corn is gone, there cannot be any considerable Crop of Clover; and as these Roots are biennial, many of the strongest Plants will perish soon after they are cut; and the weak Plants, which had made but little Progress before, will be the principal Part of the Crop for the succeeding Year, which is many Times not worth standing.

Therefore, when Ground is laid down for Grass, there should be no Crop of any Kind sown with the Seeds; and the Land should be well ploughed, and cleaned from Weeds; otherwise the Weeds will come up the first, and grow so strong, as to overbear the Grass, and if they are not pulled up, will entirely spoil it. The best Season to sow the Grass Seeds upon dry Land is about the Middle of September, or sooner, if there is an Appearance of Rain; for the Ground being then warm, if there happen some good Showers of Rain after the Seed is sown, the Grass will soon make its Appearance, and get sufficient Rooting in the Ground before Winter; so will not be in Danger of having the Roots turned out of the Ground by the Frost, especially if the Ground is well rolled before the Frost comes on, which will press it down, and fix the Earth close to the Roots. Where this hath not been practised, the Frost has often loosened the Ground so much, as to let in the Air to the Roots of the Grass, and done it great Damage, and this has been brought as an Objection to the autumnal sowing of Grass; but it will be found to have no Weight, if the above Direction is practised; nor is there any Hazard in sowing the Grass at this Season, but that of dry Weather after the Seeds are sown; for if the Grass comes up well, and the Ground is well rolled in the End of October or the Beginning of November, and repeated again the Beginning of March, the Sward will be closely joined at Bottom, and a good Crop of Hay may be expected the same Summer. In very open

exposed cold Lands, it is proper to sow the Seeds a Month earlier, that the Grass may have Time to get good rooting, before the cold Season comes on to stop its Growth; for in such Situations, Vegetation is over early in the Autumn, so the Grass being weak, may be destroyed by Frost: But if the Seeds are sown in August, and a few Showers follow soon after to bring up the Grass, it will succeed much better than any which is sown in Spring, as I have several Years experienced, on some Places as much exposed as any in England. But where the Ground cannot be prepared for sowing at that Season, it may be performed the Middle or latter End of March, according to the Season's being early or late; for in backward Springs and in cold Land, I have often sowed the Grass in the Middle of April with Success; but there is Danger in sowing late, of dry Weather; and especially if the Land is light and dry; for I have seen many Times the whole Surface of the Ground removed by strong Winds at that Season, and the Seeds driven in Heaps to one Side of the Field. Therefore whenever the Seeds are sown late in Spring, it will be proper to roll the Ground well soon after sowing, to settle the Surface, and prevent the Seeds being removed.

The Sorts of Seeds which are the best for this Purpose, are the best Sort of Upland Hay Seeds, taken from the cleanest Pastures, where there are no bad Weeds; if this Seed is sifted to clean it from Rubbish, 3, or at most 4 Bushels, will be sufficient to sow an Acre. The other Sort is the *Trifolium pratense album*, which is commonly known by the Names of White Dutch Clover, or White Honeyfuckle Grass. Eight Pounds of this Seed will be enough for one Acre. The Grass Seed should be sown first, and then the Dutch Clover Seed may be afterward sown; but they should not be mixed together, because the Clover Seeds being the heaviest, will fall to the Bottom, and consequently the Ground will be unequally sown with them.

After the Seeds are sown, the Ground should be lightly harrowed to bury the Seeds; this should be performed with a short toothed Harrow, otherwise the Seeds will be buried too deep. Two or three Days after sowing, if the Surface is dry, it should be rolled with a Barley Roller to break the Clods and smooth the Ground, which will settle it, and prevent the Seeds from being removed by the Wind.

When the Seeds are come up, if the Land should produce many Weeds, these should be drawn out before they grow so tall as to overbear the Grass; for where this has been neglected, the Weeds have taken such Possession of the Ground, as to keep down the Grass and starve it; and when these Weeds have been suffered to remain until they have shed their Seeds, the Land has been so plentifully stocked with them, as entirely to destroy the Grass; therefore it is one of the principal Parts of Husbandry, never to suffer Weeds to grow on the Land.

If the Ground is rolled two or three Times, at proper Distances after the Grass is up, it will press down the Grass, and cause it to make a thicker Bottom; for as the Dutch Clover will put out Roots from every Joint of the Branches which are near the Ground, so by pressing down the Stalks, the Roots will mat so closely together, as to form a Sward so thick as to cover the whole Surface of the Ground, and form a green Carpet, which will

will better resist the Drought. If we examine the common Pastures in Summer (in most of which there are Patches of this White Honeyfuckle Grass growing naturally) we shall find these Patches to be the only Verdure remaining in the Fields. And this the Farmers in general acknowledge, is the sweetest Feed for all Sorts of Cattle, yet never had any Notion of propagating it by Seeds. Nor has this been long practised in England; for till within a few Years, that some curious Persons imported the Seed from Brabant, where it had been long cultivated, there was not any of the Seeds sowed in England; though now several Persons save the Seeds here, which succeed full as well as any of the foreign Seeds which are imported.

As this white Clover is an abiding Plant, so it is certainly the very best Sort to sow, where Pastures are laid down to remain; for as the Hay Seeds which are taken from the best Pastures, will be composed of various Sorts of Grass, some of which may be but annual, and others biennial, so when those go off, there will be many and large Patches of Ground left bare and naked, if there is not a sufficient Quantity of the White Clover, to spread over and cover the Land. Therefore a good Sward can never be expected, where this is not sown; for in most of the natural Pastures, we find this Plant makes no small Share of the Sward; and it is equally good for wet and dry Land, growing naturally upon Gravel and Clay, in most Parts of England; which is a plain Indication how easily this Plant may be cultivated to great Advantage, in most Sorts of Land throughout this Kingdom.

Therefore the true Cause why the Land which is in Tillage is not brought to a good Turf again, in the usual Method of Husbandry is, from the Farmers not distinguishing which Grasses are annual, from those which are perennial; for if annual or biennial Grasses are sown, these will of Course soon decay; so that unless where some of their Seeds may have ripened and fallen, nothing can be expected on the Land but what will naturally come up. Therefore this, together with the covetous Method of laying down the Ground with a Crop of Corn, has occasioned the general Failure of increasing the Pasture in many Parts of England, where it is now much more valuable than any arable Land.

After the Ground has been sown in the Manner before directed, and brought to a good Sward, the Way to preserve it good is, by constantly rolling the Ground with a heavy Roller, every Spring and Autumn, as hath been before directed. This Piece of Husbandry is rarely practised by Farmers, but those who do, find their Account in it, for it is of great Benefit to the Grass. Another Thing should also be carefully performed, which is, to cut up Docks, Dandelion, Knapweed, and all such bad Weeds, by their Roots, every Spring and Autumn; this will increase the Quantity of good Grass, and preserve the Pastures in Beauty. Dressing of these Pastures every third Year, is also a good Piece of Husbandry, for otherwise it cannot be expected the Ground should continue to produce good Crops. Besides this, it will be necessary to change the Seasons of Mowing, and not to mow the same Ground every Year; but to mow one Season, and feed the next; for where the

Ground is every Year mown, it must be constantly dressed, as are most of the Grass Grounds near London, otherwise the Ground will be soon exhausted.

PAVIA. Boerb. Ind. alt. 2. p. 260. *Esculus*. Lin. Gen. Plant. 420. The scarlet flowering Horse Chestnut.

The Characters are,

The Flower has a small bellied Emplacement of one Leaf, indented in 5 Parts at the Top. The Flower has 5 roundish Petals, waved and plaited on their Borders, and narrow at their Base, where they are inserted in the Emplacement. It hath 8 Stamina which are declined, and as long as the Petals, terminated by rising Summits; and a roundish Germen sitting upon an Awl-shaped Style, crowned by an acuminate Stigma. The Germen afterward becomes an oval, Pear-shaped, leathery Capsule with 3 Cells, in which is sometimes one, and at others 2, almost globular Seeds.

There is but one Species of this Genus, viz.

PAVIA. Boerb. Ind. alt. The scarlet Horse Chestnut. Dr. Linnaeus titles it, *Esculus floribus octandris*. Sp. Plant. 344. *Esculus* with Flowers having eight Stamina.

This Plant grows naturally in Carolina and the Brazils; from the first the Seeds were brought to England, where the Plants have been of late Years much cultivated in Gardens. In Carolina it is but of humble Growth, seldom rising more than 8 or 10 Feet high; the Stalk is pretty thick and woody, sending out several Branches, which spread out on every Side, garnished with Hand-shaped Leaves composed of 5 or 6 Spear-shaped Lobes, which unite at their Base where they join the Foot Stalk; they are of a light green, having a rough Surface, and are sawed on their Edges; these have long Foot Stalks, and stand by Pairs opposite on the Branches. The Flowers are produced in loose Spikes at the End of the Branches, standing on long naked Foot Stalks which sustain 5 or 6 Flowers, which are tubulous at Bottom, but spread open at the Top, where the Petals are irregular in Size and Length, having an Appearance of a Lip Flower; they are of a bright red Colour, and have 7 or 8 Stamina the Length of the Petals. When the Flowers fade, the Germen swells to a Pear shaped Fruit, with a thick Rusty Cover having 3 Cells, one of which, and sometimes two, are pregnant with globular Seeds. It flowers in July, and the Seeds sometimes ripen here in Autumn.

It may be propagated by sowing the Seeds in the Spring, upon a warm Border of light sandy Earth; and when the Plants come up, they should be carefully cleared from Weeds, but they must not be transplanted until the Year following. As these seedling Plants are tender while they are young, they should be covered with Mats the next Winter; and this should be carefully performed in Autumn, when the early Frosts begin; for as their Tops are very tender, a small Frost will pinch them; and when the Tops are killed, they generally decay to the Ground; when this happens, they seldom make good Plants after. Therefore this should be constantly observed for 2 Years, or 3 at most, by which Time the Plants will have gotten Strength enough to resist the Frost, when they should be removed just before they begin to shoot, and placed either in a Nursery to be trained up, or else where they are to remain; observing, if the Season be dry, to water them until they have taken Root, as also to lay some Mulch on the Surface of the

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the Ground, to prevent the Sun and Wind from drying it too fast; and as the Plants advance, the lateral Branches should be pruned off, in order to reduce them to regular Stems.

You must also observe to dig the Ground about their Roots every Spring, that it may be loose, to admit the Fibres of the Roots, which, while young, are too tender to penetrate the Ground.

With this Management the Plants will greatly advance, and in 4 or 5 Years produce Flowers and often Fruits, which in warm Seasons are ripened enough to grow, so that the Plants may be multiplied very fast.

This Tree may also be propagated by budding or grafting it upon the common Horse Chestnut, which is the Method practised by the Nurserymen; but the Trees thus raised, seldom make a good Appearance long, for the common Horse Chestnut will be more than twice the Size of the other, and frequently put out Shoots below the Graft, and sometimes the Grafts are blown out of the Stocks, after 10 Years Growth; but these Stocks render the Trees hardy, and of larger Growth.

PAULLINIA. Lin. Gen. Plant. 446. Serjana. & Cururu. Plum. Nov. Gen. 34 Tab. 35.

The Characters are,

The Flower has a spreading permanent Empalement, composed of 4 small oval Leaves. It hath 4 oblong oval Petals, twice the Size of the Empalement, and 8 short Stamina, terminated by small Summits, with a turbinated Germen, having 3 obtuse Corners, supporting 3 short slender Styles, crowned by spreading Stigmas. The Germen afterward turns to a large three-cornered Capsule with 3 Cells, each containing one almost oval Seed. The Capsule of Plumier's Serjana, has the Seeds fastened to the Base; and that of Cururu, has the Seeds growing to the Top.

The Species are,

1. PAULLINIA foliis ternatis, petiolis teretiusculis, foliolis ovato-oblongis. Lin. Sp. Plant. 365. Three-leaved Paullinia with taper Foot Stalks, and oblong oval Lobes. This is the Serjana scandens, triphylla & racemosa. Plum. Nov. Gen. 34. Climbing branching Serjana with three-Leaves

2. PAULLINIA foliis biternatis, petiolis marginatis, foliolis ovatis integris. Lin. Sp. Plant. 366. Paullinia with nine Lobes in each Leaf, bordered Foot Stalks, and oval entire Lobes. This is the Serjana scandens enneaphylla & racemosa. Plum. Nov. Gen. 34. Climbing branching Serjana with nine Leaves.

3. PAULLINIA foliis ternatis, foliolis cuneiformibus, obtusis subdentatis. Lin. Sp. Plant. 365. Three-leaved Paullinia with trifoliate Leaves having Wedge-shaped Lobes, which are obtuse and somewhat indented. This is the Cururu scandens triphylla. Plum. Nov. Gen. 34. Climbing three leaved Cururu.

4. PAULLINIA foliis biternatis, foliolis ovatis subsinuatis. Lin. Sp. Plant. 366. Paullinia with double trifoliate Leaves, having oval sinuated Lobes. This is the Cururu scandens enneaphylla, fructu racemoso rubro. Plum. Climbing nine-leaved Cururu, with red branching Fruit.

5. PAULLINIA foliis pinnatis, foliolis incis, petiolis marginatis. Hort. Cliff. 52. Paullinia with winged Leaves whose Lobes are cut, and bordered Foot Stalks. This is the Cururu scandens pentaphylla. Plum. Nov. Gen. 37. Climbing five-leaved Cururu.

6. PAULLINIA foliis ternatis, foliolis ovatis subdentatis, petiolis marginatis. Burm ap. Plum. Paullinia with trifoliate Leaves, whose Lobes are oval and a little indented, and bordered Foot Stalks. Cururu scandens triphylla. Plum. Three-leaved climbing Cururu.

7. PAULLINIA foliis pinnatis tomentosis, foliolis ovatis incis, petiolis marginatis. Paullinia with winged woolly Leaves, whose Lobes are oval and cut on their Edges, and bordered Foot Stalks. This is the Cururu scandens, pentaphylla & villosa, fructu racemoso rubro. Houtt. Mss. Climbing Cururu with five Leaves which are hairy, and a red Fruit growing in long Bunches.

8. PAULLINIA foliis bipinnatis. Lin. Sp. Plant. 366. Paullinia with double winged Leaves. Serjana scandens, polyphylla & racemosa. Plum. Climbing many-leaved Serjana, with Fruit growing in long Bunches.

9. PAULLINIA foliis biternatis, foliolis oblongo-ovatis emarginatis, petiolis marginatis. Paullinia with twice trifoliate Leaves, whose Lobes are oblong, oval, indented at Top, and bordered Foot Stalks. Serjana scandens, enneaphylla, fructu racemoso, foliis non dentatis. Houtt. Mss. Climbing, nine-leaved Serjana, with Fruit growing in long Bunches, and Leaves not indented.

These Plants all grow naturally in the West-Indies, where there are several other Species not here enumerated. They have climbing Stalks with Tendrils at each Joint, by which they fasten themselves to the neighbouring Trees, and rise 30 or 40 Feet high, garnished at each Joint with one Leaf, which in some of the Species is composed of 3 Lobes like Trefoil, in others of 5 Lobes, and some have 9 Lobes. These are in some Species entire, in others they are indented at the Point, and some are cut on their Edges; in some Species their Surface is smooth, in others hairy. The Flowers come out in long Bunches like those of Currants, they are small and white, so make no Figure; these are succeeded by three-cornered Capsules having 3 Cells, which in the Cururu of Plumier, contain roundish Seeds, but those of the Serjana have winged Seeds like those of the Maple reversed, being fastened at the Extremity of the Wing to the Capsule, the Seed hanging downward.

As these Plants are so tender as not to live through the Winter in England, unless they are placed in a warm Stove, and requiring a large Share of Room, they are seldom propagated in Europe, unless in Botanical Gardens for Variety, for their Flowers have very little Beauty to recommend them.

They are propagated by Seeds, which must be obtained from the Countries, where they naturally grow, for they do not produce Seeds in England. These should be sown in small Pots, filled with light Earth, as soon as they arrive, and the Pots should be plunged into a moderate hot Bed of Tanners Bark. If these Seeds arrive in Autumn, the Pots should be plunged into the Bark Bed in the Stove, and then there will be a Probability of the Plants coming up the following Spring; but those Seeds which do not arrive here till Spring, will not come up the same Year, so the Pots, in which they are sown, should be plunged into a moderate hot Bed under a Frame, where they may be continued all the Summer, but in Autumn they should be removed into the Stove, and during the Winter the Earth in the Pots must be now and then watered,

watered, but it should be given sparingly. The following Spring the Pots should be removed out of the Stove, and plunged into a new hot Bed under a Frame, which will bring up the Plants in about 6 Weeks if the Seeds are good. When the Plants are fit to remove, they should be each planted in a small Pot filled with light Earth, and plunged into a Tan Bed, observing to shade them every Day from the Sun, till they have taken new Root, after which they should have free Air admitted daily, in Proportion to the Warmth of the Season. In Autumn they must be removed into the Bark Stove, where they should constantly remain, and must be treated as other tender Plants.

PEACH. See *Persica*.

PEAR. See *Pyrus*.

PEAS. See *Pisum*.

PEAS EVERLASTING. See *Lathyrus*.

PEDICLE is that Part of a Stalk which immediately sustains the Leaf, a Flower, or a Fruit, and is commonly called a Foot Stalk.

PEDICULARIS, Rattle, Cocks Comb, or Lousewort. There are four different Kinds of this Plant, which grow wild in Pastures in several Parts of England, and in some low Meadows are very troublesome to the Pastures, especially one Sort with yellow Flowers, which rises to a Foot high, or more, and is often in such Plenty, as to be the most predominant Plant; but this is very bad Food for Cattle, and when it is mowed with the Grass for Hay, renders it of little Value. The Seeds of this Plant are generally ripe by the Time the Grass is mowed, so that whenever Persons take Grass Seed for sowing, they should be very careful, that none of this Seed is mixed with it. As these Plants are never cultivated, I shall not trouble the Reader with their several Varieties.

PEGANUM. *Lin. Gen. Plant.* 530. *Harmala. Tourn. Inst. R. H.* 257. *Tab.* 133. *Wild Assyrian Rue.*

The Characters are,

The Flower has a permanent Emplacement composed of 5 narrow erect Leaves the Length of the Petal. It has 5 oblong oval Petals, which spread open, and 15 Awl-shaped Stamina about half the Length of the Petals, whose Bases spread into a Nectarium under the Germen, and are terminated by erect oblong Summits. It has a three-cornered roundish Germen, elevated at the Base of the Flower, with a three-cornered slender Style, the Length of the Summits, having 3 Stigmas which are longer than the Style. The Germen becomes a roundish three-cornered Capsule, having 3 Cells filled with oval acute-pointed Seeds.

We have but one Species in the English Gardens at present, viz.

PEGANUM foliis multifidis. *Hort. Upsal.* Peganum with many-pointed Leaves. This is the *Harmala. Dod. P.* 121. and the *Ruta sylvestris, flore magno albo. C. B. P.* 336. *Wild Rue* with a large white Flower.

This Plant grows naturally in Spain and Syria; it has a Root as large as a Man's little Finger, which by Age becomes woody. The Stalks decay every Autumn, and new ones arise in the Spring; these grow about a Foot long, and divide into several small Branches, garnished with oblong thick Leaves cut into several narrow Segments; they are of a dark green, and of a gummy bitterish Taste. The Flowers are produced at the

End of the Branches, sitting close between the Leaves; they are composed of 5 roundish white Petals, which open like a Rose, having 15 Awl-shaped Stamina terminated by oblong yellow erect Summits. In the Center is situated a roundish three-cornered Germen, having a three-cornered Style the Length of the Stamina, with 3 Stigmas, longer than the Style. The Germen afterward becomes a roundish three cornered Capsule, having 3 Cells which contain several oval acute-pointed Seeds. It flowers in July, and in warm Summers the Seeds will ripen here in the Autumn.

It is propagated by Seeds, which should be sown thinly on a Bed of light Earth the Beginning of April, and when the Plants come up, they must be constantly kept clean from Weeds, which is all the Culture they require till the End of October, or Beginning of November, when their Stalks decay. At which Time, if the Bed is covered with Tanners Bark. Ashes Sawdust, or such like Covering to keep out the Frost, it will be a secure Way to preserve the Roots, which when young are somewhat tender. The following March the Roots may be taken up, and transplanted into a warm Situation and a dry Soil, where they will continue several Years. This is sometimes used in Medicine.

PELECINUS. See *Biserrula*.

PELLITORY OF SPAIN. See *Anthemis*.

PELLITORY OF THE WALL. See *Parietaria*.

PENDULOUS HEADS OF FLOWERS are such as hang downward.

PENNATED. A pennated Leaf (called in *Latin Folium Pennatum*) is a compound Leaf, divided into several Parts (each of which is called a Lobe, placed along the middle Rib, either alternately, or by Pairs. When the middle Rib is terminated by an odd Lobe, it is said to be unequally pennated, and equally pennated, when it is not terminated by an odd Lobe. When the Lobes are all nearly of the same Form and Bigness, it is called an uniform pennated Leaf; when they are not so, it is said to be difform. Examples of pennated Leaves are the Ash, Walnut, &c.

PENNY-ROYAL. See *Pulegium*.

PENTAPETALOUS FLOWERS are such as have five Leaves.

PENTAPETES. *Lin. Gen. P. Alcea. Raii Supp.*

The Characters are,

The Flower has for the most part a double Emplacement, the outer being small and composed of 3 Leaves, the inner is cut into 5 Parts which are reflexed. It has 5 oblong Petals which spread open, and 15 narrow Stamina joined in a Tube at their Base, with 5 long coloured Summits, which are erect and barren; between each of these are 3 Stamina terminated by oblong erect Summits. It has a roundish Germen, with a cylindrical Style the Length of the Stamina, crowned by a thick Stigma. The Germen becomes an oval ligneous Capsule with 5 Cells filled with oblong Seeds.

We have but one Species of this Genus at present in the English Gardens, viz.

PENTAPETES foliis bastato-lanceolatis serratis. *Lin. Sp. Plant.* 698. Pentapetes with Halberd-pointed, Spear-shaped, sawed Leaves. This is the *Alcea Indica lucida bastato folio, flore blattaria phœnicio. Raii Supp.*

523. *Indian Vervain Mallow* with a lucid Spear-shaped Leaf, and a scarlet Flower like Moth Mullein.

This Plant grows naturally in *India*, from whence I have several Times received the Seeds; it is annual, and dies in Autumn, soon after it has ripened Seeds. This hath an upright Stalk from 2 to 3 Feet high, sending out Side Branches the whole Length, those from the lower Part of the Stalks are the longest, the others gradually diminish, so as to form a Sort of Pyramid. These are garnished with Leaves of different Forms; the lower Leaves, which are largest, are cut on their Sides towards the Base into 2 Side Lobes which are short, and the Middle is extended 2 or 3 Inches farther in Length, so that the Leaves greatly resemble the Point of Halberds; they are slightly sawed on their Edges, and of a lucid green on their upper Side, but are paler on their under, standing upon pretty long Foot Stalks. The Leaves, which are on the upper Part of the Branches, are much narrower, and some of them have very small Indentures on their Sides; these sit closer to the Stalks, and are placed alternately. From the Wings of the Stalks the Flowers come out; they are for the most part single, but sometimes their are two arising at the same Place from the Sides of the Foot Stalk of the Leaves. The Foot Stalk of the Flower is short and slender. The exterior Emplement of the Flower is composed of 3 short Leaves, which fall off soon; the interior is of one Leaf, cut at the Top into 5 acute Segments, which spread open, and are almost as long as the Petal. The Flower is of one Petal cut into 5 obtuse Segments almost to the Bottom, but as they are joined and fall off in one Piece, so the Flower is monopetalous, according to Mr. Ray and Tournefort. In the Center of the Flower arises a short thick Column, to which adhere 15 short Stamina terminated by oblong erect Summits, and between every third Stamen is situated a larger Stamen with an oblong erect Summit of a deep red Colour; these 5 large Summits are barren, having no *Farina fecundans* upon them. Between the Stamina is situated a roundish Germen, supporting a Style the Length of the Stamina, which is crowned by a thick Stigma. These being all joined at their Base into a Sort of Column, distinguish the Tribe to which it belongs, which is the malvaceous, so that though the Flower at first Appearance greatly resembles the Flowers of Moth Mullein, yet upon Examination of its essential Characters, it will be found to belong to the Class here-mentioned. The Flowers are of a fine scarlet Colour, appearing in *July*, and are succeeded by roundish Capsules with 5 Cells, which are a little woody, each Cell inclosing 3 or 4 oblong Seeds, which ripen in Autumn.

The Seeds of this Plant must be sown on a good hot Bed early in *March*, and when the Plants are fit to transplant, there should be a new hot Bed prepared to receive them, into which should be plunged some small Pots filled with good Kitchen Garden Earth; in each of these should be one Plant put, giving them a little Water to settle the Earth to their Roots; they must also be shaded from the Sun till they have taken new Root, then they should be treated as other tender exotick Plants, admitting the free Air to them every Day in Proportion to the Warmth of the Season, and covering

the Glasses with Mats every Evening to keep them warm. When the Plants are advanced in Growth so as to fill the Pots with their Roots, they should be shifted into larger Pots filled with the same Sort of Earth, and plunged into another hot Bed, where they may remain as long as they can stand under the Glasses of the Bed without being injured, and afterward they must be removed either into the Stove or a Glass Case, where they may be screened from the Cold, and in warm Weather have Plenty of fresh Air admitted to them. With this Management the Plants will begin to flower early in *July*, and their will be a Succession of Flowers till the End of *September*, during which Time they make a good Appearance. The Seeds ripen gradually after each other in the same Succession as the Flowers were produced, so they should be gathered as soon as their Capsules begin to open at the Top. These Plants are sometimes turned out of the Pots, when they are strong and planted in warm Borders, where, if the Seasons prove very warm, the Plants will flower pretty well; but these very rarely perfect Seeds, so that in order to have them in Perfection, they must be treated in the Manner before directed.

PENTAPHYLLOIDES. See *Potentilla*.

PEONY. See *Pæonia*.

PEPO. See *Cucurbita*.

PERENNIAL PLANTS are such whose Roots will abide many Years, whether they retain their Leaves in Winter or not; those which retain their Leaves, are called Ever-greens, but such as cast their Leaves, are called Deciduous or Perdisols. Some of these have annual Stalks, which die to the Root every Autumn, and shoot up again in the Spring; to which *Jungius* gives the Title of *Radix restibilis*.

PERESKIA. *Plum. Nov. Gen. 37. Tab. 26. Cactus. Lin. Gen. Plant. 539. Gooseberry, vulgè.*

The Characters are,

It hath Rose-shaped Flower consisting of several Leaves, placed orbicularly, whose Cup becomes a soft, fleshy, globular Fruit beset with Leaves. In the Middle of the Fruit are many flat roundish Seeds included in a Mucilage.

We have but one Species of this Plant, viz.

PERESKIA aculeata, flore albo, fructu flavescente. Plum. Nov. Gen. 37. Prickly Pereskia with a white Flower, and a yellowish Fruit. This is the Cactus caule tereti arboreo spinoso, foliis lanceolato-ovatis. Lin. Hort. Upsal. 122. Cactus with a taper Tree-like, prickly Stalk, and Spear-shaped oval Leaves.

This Plant grows in some Parts of the *Spanish West-Indies*, from whence it was brought to the *English* Settlements in *America*, where it is called a Gooseberry, and by the *Dutch* it is called Blad Apple. It hath many slender Branches, which will not support themselves, so must be supported by Stakes, or they will trail on whatever Plants grow near them. These Branches, as also the Stem of the Plant, are beset with long whitish Spines, which are produced in Tufts. The Leaves are roundish, very thick, and succulent; the Fruit is about the Size of a Walnut, having Tufts of small Leaves on it, and hath a whitish mucilaginous Pulp.

It may be propagated by planting the Cuttings during any of the Summer Months: These should be planted in Pots filled with fresh light Earth, and plunged in-

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to a moderate hot Bed of Tanners Bark, observing to shade them from the Sun in the Heat of the Day, also to refresh them every third or fourth Day with Water. In about 2 Months the Cuttings will have made good Roots, when they may be carefully taken out of the Pots, and each planted in a Pot filled with fresh Earth, and then plunged into the hot Bed again, where they may remain during the Summer Season; but at Michaelmas, when the Nights begin to be cold, they should be removed into the Stove, and plunged in the Bark Bed. During the Winter Season, the Plants must be kept warm, and should be watered twice a Week; but in cold Weather it should not be given in large Quantities. In Summer they must have a large Share of Air, and must be more plentifully watered, but they should constantly remain in the Stove, for though they will bear the open Air in Summer, in a warm Situation, yet they will make no Progress, if they are placed abroad; nor do they thrive near so well in the dry Stove, as when they are plunged in the Tan, so that the best Way is to set them next a Trellice, at the Back of the Tan Bed, to which their Branches may be fastened, to prevent their trailing on other Plants. This Plant has not as yet produced either Flowers or Fruit in England; but as there are several Plants pretty well grown in the Gardens of the Curious, we may expect some of them will flower in a short Time.

PERICLYMENUM. Tourn. Inst. *Caprifolium*. Tourn. Inst. *Lonicera*. Lin. Gen. Pl. 210. Honeyfuckle; in French, *Chevre-feuille*.

The Characters are,

The Empalement is small, and cut into 5 Parts sitting upon the Germen. The Flower is of one Petal, having an oblong Tube, cut at the Top into 5 Segments which turn backward. It has 5 Awl-shaped Stamina almost the Length of the Petal, terminated by oblong Summits, and a roundish Germen situated below the Flower, supporting a slender Style crowned by an obtuse Stigma. The Germen becomes an umbilicated Berry with 2 Cells, each containing one roundish Seed.

The Species are,

1. **PERICLYMENUM** *floribus capitatis terminalibus, foliis omnibus connatis sempervirentibus*. Honeyfuckle with Flowers growing in Heads at the End of the Branches, and Leaves joined round the Stalk, and ever-green. This is the *Periclymenum perfoliatum Virginianum sempervirens* & *florens*. H. L. Perfoliate, ever-green, Virginia Honeyfuckle, which always flowers, commonly called Trumpet Honeyfuckle.

2. **PERICLYMENUM** *racemis lateralibus oppositis, floribus pendulis, foliis lanceolatis integerrimis*. Honeyfuckle with Flowers in long Bunches growing opposite, and hanging down, and entire Spear-shaped Leaves. This is the *Periclymenum racemosum flore flavescente, fructu niveo*. Hort. Elth. 306. Honeyfuckle with yellowish Flowers growing in Bunches, and a snowy Fruit.

3. **PERICLYMENUM** *corymbis terminalibus, foliis ovatis verticillatis petiolatis*. Honeyfuckle with round Bunches of Flowers at the End of the Branches, and oval Leaves growing in Whorls, having Foot Stalks. *Periclymenum aliud arborescens ramulis inflexis, flore corallino*. Plum. Cat. Another Tree-like Honeyfuckle with inflexed Branches, and a Coral-coloured Flower.

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4. **PERICLYMENUM** *corymbis terminalibus, foliis ovatis acutis*. Honeyfuckle with round Bunches of Flowers terminating the Branches, and oval acute Leaves. This is the *Periclymenum foliis acutis, floribus profunde dissectis*. Feuill. Peru. 2. p. 760. Tab. 45. Honeyfuckle with acute-pointed Leaves, and Flowers deeply cut.

5. **PERICLYMENUM** *capitulis ovatis imbricatis terminalibus, foliis omnibus distinctis*. Honeyfuckle with oval imbricated Heads terminating the Stalks, and all the Leaves distinct. This is the *Caprifolium Germanicum*. Dod. p. 411. The German Honeyfuckle.

6. **PERICLYMENUM** *floribus verticillatis terminalibus sessilibus, foliis summis connato-perfoliatis*. Hort. Cliff. 45. Honeyfuckle with Whorls of Flowers sitting close at the Ends of the Branches, and the upper Leaves surrounding the Stalk. This is the *Caprifolium Italicum*. Dod. p. 411. Italian Honeyfuckle.

7. **PERICLYMENUM** *floribus corymbosis terminalibus, foliis hirsutis distinctis, virminibus tenuioribus*. Honeyfuckle with a Corymbus of Flowers terminating the Stalks, hairy Leaves growing distinct, and very slender Branches, commonly called English Honeyfuckle or Woodbine.

8. **PERICLYMENUM** *floribus verticillatis terminalibus sessilibus, foliis connato-perfoliatis sempervirentibus glabris*. Honeyfuckle with whorled Flowers sitting close, and terminating the Stalks, and smooth ever green Leaves surrounding the Stalks. This is the *Caprifolium perfoliatum sempervirens, floribus speciosis*. Hort. Chesh. The ever-green Honeyfuckle, having beautiful Flowers.

The 1st Sort grows naturally in Virginia, and many other Parts of North-America, but has been long cultivated in the English Gardens by the Title of Virginia Trumpet Honeyfuckle. Of this there are two Varieties, if not distinct Species, one being much hardier than the other. The old Sort, which came from Virginia, has stronger Shoots; the Leaves are of a brighter green; the Bunches of Flowers are larger, and deeper coloured than the other, which came from Carolina. These Plants have the Appearance of the common Honeyfuckle, but the Shoots are weaker than any of those, except the wild Sort called Woodbine; they are of a purplish red Colour, and smooth. The Leaves are of an oblong oval Shape inverted, and closely surround the Stalk; of a lucid green on their upper Side, but pale on their under. The Flowers are produced in Bunches at the End of the Branches; these have long slender Tubes, which are enlarged at the Top, where they are cut into 5 almost equal Segments. The Outside of the Flower is of a bright scarlet, and the Inside yellow; they have great Appearance of the Honeyfuckle, but are not so deeply divided, nor are the Segments reflexed. They have no Odour, but for the Beauty of their Flowers, and their long Continuance in flower, together with their Leaves being ever-green, they are preserved in most curious Gardens.

These should be planted against Walls or Pales, to which their Branches should be trained for Support, otherwise they will fall to the Ground; for they cannot be reduced to Heads like many of the Honeyfuckles, because their Branches are too weak and rambling, and are liable to be killed in severe Winters; therefore they should be planted to a warm Aspect, where they will

will begin to flower the latter End of *June*, and there will be a Succession of Flowers till the Autumn. These are propagated by laying down their young Branches, which will easily take Root, and may be afterward treated like the Honeyfuckle.

The 2d Sort grows naturally in *Jamaica*; this hath many slender Branches, which cannot support themselves, but trail upon any neighbouring Bushes. They grow 8 or 10 Feet long, are covered with a brown Bark, and garnished with Spear-shaped Leaves about two Inches and a Half long, and one broad in the Middle; of a lucid green on their upper Side, but pale on their under, standing by Pairs opposite. The Flowers come out from the Side of the Branches at each Joint; they are ranged on each Side the Foot Stalk in long Bunches like Currants. The Bunches come out opposite by Pairs; they are 3 or 4 Inches long. The Flowers are small, of a yellowish green, and are succeeded by small Berreis of a Snow white, from whence the Plant is called Snowberry Bush in *America*.

The 3d Sort grows naturally in some of the Islands in the *West-Indies*; this rises with a shrubby Stalk 10 or 12 Feet high, sending out many slender Branches, covered with a light brown Bark, and garnished with oval Leaves near 2 Inches long, and an Inch and a Quarter broad, four of them coming out at each Joint in Whorls round the Stalk; they stand upon short Foot Stalks, and have one strong Mid-rib, with several Veins running from the Mid-rib to the Sides. The Flowers come out in round Bunches at the End of the Branches; they are of a deep Coral Colour on their Outside, but of a pale red within. This was found growing in *Jamaica* by the late Dr. *Houfoun*, who brought it to *England*.

The 4th Sort grows naturally in the Kingdom of *Chili*; Father *Feuillée* found it near the City of *Conception*; it was afterward found by the late Dr. *Houfoun* growing at a little Distance from *Carthagena* in *New Spain*. This hath a shrubby Stalk near 4 Inches thick, covered with a gray Bark, dividing into many Branches, which rise about 12 Feet high; they are garnished with stiff Leaves placed by Pairs opposite, which are an Inch and a Half long, and one broad, ending in a Point; of a lucid green on their upper Side, but pale on their under. The Flowers are produced in round Bunches at the End of the Branches; they are tubulous, small, of a deep red, and cut into 4 Segments at the Top. These are succeeded by oval Berries the Size of small Olives, inclosing a hard Seed.

The Branches of this Shrub are used for dying a black in the *Spanish West-Indies*, which cannot be washed out. This Dye is made with the Wood of the Shrub cut into small Pieces, and mixed with a Plant called *Pangur*, and a black Earth called *Robbo*, boiling them in common Water till it becomes of a proper Consistence.

These 3 Sorts are too tender to thrive in this Country without artificial Heat; they are propagated by Seeds, which must be procured from the Countries, where they naturally grow, for they do not ripen here. These should be sown in Pots, and plunged into a moderate hot Bed, where they may remain till Autumn, for the Plants rarely come up the first Year, so the Pots should be removed into the Stove for the Winter

Season, and the following Spring placed on a fresh hot Bed, which will bring up the Plants; when they are fit to remove, they should be each planted in a small Pot filled with light Earth, and plunged into a fresh hot Bed, shading them from the Sun, till they have taken new Root, and then they must be treated as other tender Plants from those Countries. As the Plants obtain Strength, they should be more hardily treated, by placing them abroad in a sheltered Situation for 2 Months or 10 Weeks, in the warmest Part of the Summer, and in the Winter they may be placed in the dry Stove, kept to a moderate degree of Warmth, where they will thrive, and produce their Flowers in Autumn.

The 5th Sort is the common *Dutch* or *German* Honeyfuckle, which has been generally supposed the same with the *English* wild Sort called Woodbine, but is undoubtedly a very different Species, for the Shoots of this are much stronger. The Plants may be trained with Stems, and formed into Heads, which the wild Sort cannot, their Branches being too weak and trailing for this Purpose. The Branches of this are smooth, of a purplish Colour, garnished with oblong oval Leaves 3 Inches long, and an Inch and 3 Quarters broad, of a lucid green on their upper Side, but a pale on their under, having very short Foot Stalks; they are placed by Pairs, but are not joined at their Base. The Flowers are produced in Bunches at the End of the Branches, each Flower arising out of a scaly Cover, which Covers, after the Flowers fade, form an oval Head, whose Scales lie over each other, like those of Fish. The Flowers are of a reddish Colour on their Outside, and yellowish within; of a very agreeable Odour. This Sort flowers in *June*, *July*, and *August*. There are 2 other Varieties of this Species, one called the long blowing, and the other the late red Honeyfuckle.

The 6th Sort is commonly called the *Italian* Honeyfuckle; of this there are 2 or 3 Varieties, the early white Honeyfuckle is one; this is the first which flowers, always appearing in *May*. The Branches are slender, covered with a light green Bark, and garnished with oval Leaves of a thin Texture, placed by Pairs sitting close to the Branches, but those which are situated toward the End of the Branches, join at their Base, so that the Stalk seems as if it came through the Leaves. The Flowers are produced in whorled Bunches at the End of the Branches; they are white, and have a very fragrant Odour, but are of short Duration, so that in about a Fortnight, they are entirely over, and soon after the Leaves appear as if blighted and sickly, making an indifferent Appearance the whole Summer, which has rendered them less valued than the others. The other Variety is the yellow *Italian* Honeyfuckle, which is the next in Succession to the white. The Shoots of this are much like those of the former, but have a darker Bark; the Leaves are also of a deeper green; the Flowers are of a yellowish red, and appear soon after the white; they are not of much longer Duration, and are succeeded by red Berries containing one hard Seed inclosed in a soft Pulp, which ripens in Autumn.

The 7th Sort is the common wild *English* Honeyfuckle or Woodbine; this grows naturally in the Hedges in many Parts of *England*. The Branches are very

slender and hairy, trailing over the neighbouring Bushes, and twining round the Boughs of Trees; the Leaves are oblong, hairy, and distinct, not joined at their Base; they are placed by Pairs opposite; the Flowers are produced in long Bunches at the End of the Branches. There are 2 Varieties, one with white, the other yellowish red Flowers. These appear in *July*, and there is a Succession of Flowers till Autumn.

There is also a Variety of this with variegated Leaves, and one with cut Leaves somewhat like the Leaves of Oak, and one of these with variegated Leaves; but, as these are accidental Varieties, I have not enumerated them.

The 8th Sort is supposed to grow naturally in *North America*; this hath strong Branches, covered with a purple Bark, and garnished with lucid green Leaves embracing the Stalks, which continue their Verdure all the Year. The Flowers are produced in whorled Bunches at the End of the Branches; there are frequently 2 and sometimes 3 of these Bunches rising one out of another; they are of a bright red on their Outside, and yellow within; of a strong aromatick Flavour. This Sort begins to flower in *June*, and there is a Succession of Flowers till the Frost puts a Stop to them, so that it is the most valuable of all the Sorts.

All the Sorts of Honeyfuckles are propagated by Layers or Cuttings: When you do it by Layers, the young Shoots only should be chosen for that Purpose; these should be layed in Autumn, and by the following Autumn they will have taken Root, when they should be cut off from the Plants, and either planted where they are to remain, or into a Nursery to be trained up for Standards, which must be done by fixing down Stakes to the Stem of each Plant, to which their principal Stalk should be fastened, and all the other must be cut off; the principal Stalk must be trained to the intended Height of the Stem, then it should be shortened, to force out lateral Branches, and these should be again stopped to prevent their growing too long; by constantly repeating this as the Shoots are produced, they may be formed into a Sort of Standard; but if any Regard is had to their flowering, they cannot be formed into regular Heads, for by constantly shortening their Branches, the Flower Buds will be cut off, so that few Flowers can be expected; and as it is an unnatural Form for these Trees, so there should be but few of them reduced to it, for when they are planted near other Bushes, in whose Branches the Shoots of the Honeyfuckles may run and mix, they will flower much better and have a finer Appearance than when they are more regularly trained; therefore, when the Plants are in the Nursery, if 2 or 3 of the principal Shoots are trained up to the Stakes, and the others are entirely cut off, they will be fit to transplant the following Autumn, to the Places where they are to remain; for though the Roots may be transplanted at a greater Age, yet they do not thrive so well as when removed while they are young.

When these Plants are propagated by Cuttings, they should be planted in *September*, as soon as the Ground is moistened by Rain. The Cuttings should have 4 Joints, 3 of which should be buried in the Ground, and the 4th above the Surface, from which the Shoots are

to be produced. These may be planted in Rows, at about a Foot Distance Row from Row, and 4 Inches asunder in the Rows, treading the Earth close to them; and as the ever-green and late red Honeyfuckles, are a little more tender than the other Sorts, so if the Ground between the Rows where these are planted, is covered with Tanners Bark or Mulch, to keep out the Frost in Winter, and the drying Winds of the Spring, it will be of great Advantage to the Cuttings; and if the Cuttings of these Sorts, have a small Piece of the two Years Wood at their Bottom, there will be no Hazard of their taking Root. The Plants raised from Cuttings, are preferable to those propagated by Layers, as they have generally better Roots.

These Plants will grow in almost any Soil or Situation (except the last mentioned, which will not thrive where they are too much exposed to the Cold in Winter) they thrive best in a soft sandy Loam, and will retain their Leaves in greater Verdure in such Ground, then if planted in a dry gravelly Soil, where in warm dry Seasons their Leaves often shrink, and hang in a disagreeable Manner; nor will those Sorts which naturally flower late in Autumn, continue so long in Beauty on a dry Soil unless the Season proves moist and cold, as those in a gentle Loam, not too stiff or wet.

There are few Sorts of Shrubs which deserve Cultivation better than most of these, for their Flowers are very beautiful, and perfume the Air to a great Distance, especially in the Mornings and Evenings, and in cloudy Weather, when the Sun does not exhale their Odour, and raise it too high to be preceptible; so that in all retired Walks, their cannot be too many of these intermixed with the other Shrubs. I have seen these Plants intermixed in Hedges planted either with Alder or Laurel, where the Branches have been artfully trained between those of the Hedge; from which the Flowers have appeared dispersed from the Bottom of the Hedge to the Top, and being intermixed with the strong green Leaves of the Plants which principally compose the Hedge, they have made a fine Appearance; the best Sorts for this Purpose, are the ever-green and long-blowing Honeyfuckles, because their Flowers continue in Succession much longer than the other Sorts.

These Plants may be propagated by Seeds, but unless they are sown in the Autumn soon after they are ripe, the Plants will not come up the first Year.

PERIPLOCA. *Tourn. Inst. R. H. 93. Tab. 22. Lin. Gen. Plant. 267. Virginian Silk, vulg.*

The Characters are,

The Flower hath a small permanent Empalement, cut into 5 Points. The Flower has one plain Petal, cut into 5 narrow Segments, indented at their Points, with a small Nectarium going round the Center of the Petal, and the 5 incurved Filaments which are not so long as the Petal, and 5 short Stamina terminated by erect Summits which join in a Head. It has a small bisid Germen with scarce any Style, crowned by 2 simple Stigmas. The Germen becomes 2 oblong, bellied Capsules with one Cell, filled with Seeds crowned with Down, lying over each other like the Scales of Fish.

The Species are,

1. PERIPLOCA *floribus internis hirsutis. Lin. Sp. Plant. 211. Virginia Silk* with Flowers hairy on their Inside.

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Inside. This is the *Periploca foliis oblongis*. Tourn. Inst. R. H. 93. Virginia Silk with oblong Leaves.

2. *PERIPLOCA caule birsuto*. Lin. Sp. Pl. 211. Virginia Silk with a hairy Stalk. This is the *Apocynum scandens*, Africanum, vineæ pervinæ folio subincanum. Com. Plant. Rar. 18. Climbing African Dogbane with a hoary Periwinkle Leaf.

3. *PERIPLOCA foliis oblongo-cordatis pubescentibus, floribus alaribus, caule fruticoso scandente*. Virginia Silk, with oblong Heart-shaped Leaves, covered with soft Hairs, and Flowers proceeding from the Sides of the Stalks, which are shrubby and climbing. This is the *Periploca foliis cordatis holsericeis, floribus parvis, albis, campaniformibus*. Houst. Mss. Periploca with Heart-shaped silky Leaves, and small white Bell-shaped Flowers.

4. *PERIPLOCA foliis oblongo-ovatis, filiquis teretibus articulatis, caule scandente*. Virginia Silk with oblong oval Leaves, taper jointed Pods, and a climbing Stalk. This is the *Apocynum scandens, amygdali folio filiquis emerit*. Plum. Cat. 3. Climbing Dogbane with an Almond Leaf, and a Pod like Scorpion Sena.

5. *PERIPLOCA foliis ovato-lanceolatis, floribus terminalibus, filiquis, articulatis, caule fruticoso scandente*. Virginia Silk with oval Spear-shaped Leaves, Flowers terminating the Stalks, taper jointed Pods, and a shrubby climbing Stalk. This is the *Apocynum scandens, pervinæ folio, flore luteo, filiquis emerit*. Houst. Mss. Climbing Dogbane with a Periwinkle Leaf, a yellow Flower, and Pods like Scorpion Sena.

6. *PERIPLOCA foliis lanceolatis, acuminatis, floribus umbellatis axillaribus, caule fruticoso scandente*. Virginia Silk with Spear-shaped acute-pointed Leaves, Flowers growing in Umbels from the Sides of the Stalks, and a shrubby climbing Stalk. This is the *Apocynum fruticosum scandens genistæ Hispanicæ facie, floribus lacteis odoratis*. Sloan. Cat. Jam. 89. Shrubby climbing Dogbane resembling Spanish Broom, and milky sweet Flowers.

7. *PERIPLOCA foliis subcordatis obtusis, infernè incanis caule birsuto scandente*. Virginia Silk, with Heart-shaped obtuse Leaves, which are hoary on their under Side and a hairy climbing Stalk. This is the *Apocynum Afrum scandens, folio rotundo subincano nummulariæ*. Boerb. Ind. alt. 1. p. 314. African climbing Dogbane, with a round hoary Leaf like Moneywort, which is hoary on the under Side.

The 1st Sort grows naturally in Syria, but is hardy enough to thrive in the open Air in England. It hath twining shrubby Stalks, covered with a dark Bark, which twist round any neighbouring Support, and will rise more than 40 Feet high, sending out slender Branches from the Side, which twine round each other, and are garnished with oval Spear-shaped Leaves near 4 Inches long, and 2 broad in the Middle, of a lucid green on their upper Side, but pale on their under, standing by Pairs, upon short Foot Stalks. The Flowers come out toward the End of the small Branches in Bunches, they are of a purple Colour, and hairy on their Inside, composed of one Petal cut into 5 Segments almost to the Bottom, which spread open in Form of a Star, and within is situated a Nectarium, which goes round the five short Stamina and Germen, and is hairy. The Germen turns to a double long taper Pod or Capsule, filled with compressed Seeds lying over each other

like the Scales of Fish, having a soft Down fixed to their Top. This Plant flowers in July and August, but rarely ripens Seeds in England.

It is easily propagated by laying down the Branches, which will put out Roots in one Year, and may then be cut from the old Plant, and planted where they are to remain. These may be transplanted in Autumn, when their Leaves begin to fall, or in Spring before they begin to shoot, and must be planted where they may have Support, otherwise they will trail on the Ground, and fallen about whatever Plants are near them.

The 2d Sort grows naturally in Africa; this hath many slender Stalks, which twine about each other, or any neighbouring Support, and will rise near 3 Feet high, putting out several small Side Branches, these are hairy as are also the Leaves, which are oval, about three Quarters of an Inch long, and half an Inch broad, standing by Pairs on very short Foot Stalks. The Flowers come out in small Bunches from the Side of the Stalks, they are small, and of a worn-out purplish Colour, and a sweet Scent, being cut into 5 narrow Segments almost to the Bottom. It flowers in the Summer Months, but does not produce Seeds here. There is a Variety of this with smooth Leaves and Stalks,

The 3d Sort was discovered by Dr. Houstoun grown naturally at La Vera Cruz in America. This rises with a strong woody Stalk 5 or 6 Feet High covered with a gray Bark putting out many weak Branches, which twist themselves about any neighbouring Support and rise 20 Feet; they are garnished with Heart-shaped Leaves 3 Inches long, and 2 broad near their Base; they are of a yellowish green, covered with silky Hairs, which are soft to the Touch; they stand opposite by Pairs upon pretty long Foot Stalks. The Flowers come out in small Bunches from the Wings of the Leaves, they are small, white, and of the open Bell Shape; these are succeeded by swelling taper Pods, filled with Seeds crowned with long feathery Down.

The 4th Sort grows naturally at Campeachy, from whence the late Dr. Houstoun sent the Seeds. This hath slender, shrubby, climbing Stalks, which fasten round the neighbouring Trees, and rises 30 Feet, covered with a purplish Bark, garnished with oblong oval Leaves, about two Inches long and one broad, of a lucid green, and pretty thick Texture; these stand upon short Foot Stalks opposite. The Flowers are in small Bunches, standing upon very long Foot Stalks; they are white, and are succeeded by very slender taper Pods, near a Foot long, having small swelling Joints an Inch apart; in each of these are lodged 3 or 4 flat oval Seeds, with a Plume of Down on their Top.

The 5th Sort grows naturally in Jamaica, from whence the late Dr. Houstoun sent it to England in 1730. This hath shrubby climbing Stalks like the former, which twine about the neighbouring Trees, and rise 10 or 12 Feet high, putting out a great Number of small Branches, which are garnished with oval Spear-shaped Leaves one Inch and a Half long, and three Quarters of an Inch broad, of a lucid green, standing on short Foot Stalks opposite. The Flowers are produced at the End of the Branches, 3 or 4 together upon the same short Foot Stalk; these have a short Tube, which is cut into 5 Segments at the Top, which spread open; they are yellow,

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yellow, and are succeeded by slender Pods between 4 and 5 Inches long, which have swelling Joints where the Seeds are lodged, and a brown feathery Down on their Top. The Joints of these Pods do not swell so much as those of the other, nor are the Spaces between the Joints so slender.

The 6th Sort grows naturally in *Jamaica*; this hath slender climbing Stalks covered with a green Bark, which twine about the neighbouring Trees, and rise 30 Feet high; the Joints are far asunder, at each are placed two Spear-shaped Leaves opposite, standing upon short Foot Stalks; they are an Inch and a Half long, and half an Inch broad, of a light green, ending in acute Points. The Flowers come out from the Side of the Stalks in a Sort of Umbel, standing upon Foot Stalks between 2 and 3 Inches long; they are of a pure white, and smell very sweet, and are cut into 5 Segments almost to the Bottom; these are succeeded by taper Pods about 2 Inches long, ending in acute Points, filled with oblong Seeds, crowned with long Down.

The 7th Sort grows naturally at the *Cape of Good Hope*; this hath very slender twining Stalks, which twist about each other, and any of the neighbouring Plants, rising 4 or 5 Feet high; they are hairy and garnished with Leaves almost Heart-shaped; they are about an Inch and a Half long, and one Inch broad, hoary on their under Side, but of a lucid green on the upper, standing by Pairs on short Foot Stalks. The Flowers come out in Clusters from the Side of the Stalk, they are small, and cut into 5 Segments, which spread open flat; they are of a worn-out purple Colour, and have a strong sweet Scent. These appear in *July* and *August*, but are not succeeded by Seeds in *England*.

The 2d and last mentioned Sorts are hardy enough to thrive in this Country, with a little Protection from Frost in Winter. If these are sheltered under a common Frame, or placed in a Green-house during the Winter Season, and placed abroad with other hardy exotick Plants in Summer, the will thrive and flower very well; but as all the Plants of this Genus have a milky Juice, so they should not have much Wet, especially in cold Weather, lest it rot them. They are easily propagated by laying down their Branches, which in one Year will have Roots enough to transplant; these should be planted in a light sandy Loam not rich, and the Pots must not be too large, for when they are over potted, they will not thrive.

The 3d, 4th, 5th, and 6th, Sorts, are tender; these will not thrive in *England*, unless they are placed in a warm Stove. They may be propagated by laying down their Branches, as the former; or from Seeds, when they can be procured from the Places where they naturally grow. These should be sown upon a good hot Bed, and when the Plants come up, they must be treated as other tender exoticks.

If these Plants are constantly kept plunged in the Tan Bed of the Stove, they will thrive and flower much better than in any other Situation, but the Stove should not be kept too warm in Winter; and in the Summer, the Plants should have a large Share of free Air admitted to them; for when they are kept too close, their Leaves will be covered with Insects, and the the Plants will become silky in a short Time.

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All the Species of this Genus are supposed to be hurtful to Animals, as the Dogbanes in general are, and these are very near akin to them, both in their Characters and Qualities.

PERIWINKLE. See Vinca.

PERSEA. *Plum. Nov. Gen. 44. Tab. 20. Laurus. Lin. Gen. Plant. 452.* The Avocado, or Avogato Pear.

The Characters are,

The Flower hath no Empalement, but is composed of six Petals ending in acute Points, which spread open. It hath six Stamina which are about half the Length of the Petals, terminated by roundish Summits, and a short Style crowned by a pyramidal Germen, which becomes a large fleshy pyramidal Fruit, inclosing an oval Seed having two Lobes.

We know but one Species of this Plant, viz.

PERSEA *Clus. Hist.* The Avocado, or Avogato Pear.

This Tree grows in great Plenty in the *Spanish West-Indies*, as also in the Island of *Jamaica*, and hath been transplanted into most of the *English* Settlements in the *West-Indies*, on Account of its Fruit; which is not only esteemed by the Inhabitants as a Fruit to be eaten by Way of Desert, but is very necessary for the Support of Life. The Fruit is very insipid, for which Reason they generally eat it with the Juice of Lemons and Sugar, to give it a Piquancy. It is very nourishing, and is reckoned a great Incentive to Venery. Some People eat it with Vinegar and Pepper.

This Tree, in the warm Countries, rises 30 Feet or more, and has a Trunk as large as our common Apple Trees; the Bark is smooth, and of an Ash Colour; the Branches are beset with pretty large, oblong, smooth Leaves, like those of Laurel, of a deep green Colour, and continue on the Tree throughout the Year. The Flowers and Fruit are, for the most Part produced toward the Extremity of the Branches. The Fruit is as large as one of the largest Pears, inclosing a large Seed with two Lobes included in a thin Shell.

In *Europe* this Plant is preserved as a Curiosity, by those Persons who delight in collecting exotick Plants; and though there is little Hope of its producing Fruit, yet for the Beauty of its shining green Leaves, which continue through the Winter, it deserves a Place in every curious Collection of Plants.

It is propagated by Seeds, which should be obtained as fresh as possible, from the Countries of its Growth; and if they are brought over in Sand, they will be more likely to grow, than such as are brought over dry. These Nuts or Seeds should be planted in Pots, filled with light rich Earth, and plunged into a hot Bed of Tanners Bark, which should be kept pretty warm. The Pots should be also frequently watered when the Earth appears dry, which will greatly facilitate the Vegetation of the Seed, provided the Water is not given in large Quantities, which would rot them. In about five or six Weeks the Plants will come up, when they must be treated very tenderly, for the Bed must be kept in a due Temperature of Heat; and when the Day proves warm, the fresh Air should be admitted to the Plants, by raising the Glasses a little. When they have grown about 4 Inches high, they should be carefully transplanted; and where there are several Plants in one Pot, they must be parted, being careful to preserve a Ball of Earth to the Root of each, and planted into separate small Pots

filled

filled with light rich Earth, and then plunged into a hot Bed of Tanners Bark, observing to shade them until they have taken new Root; after which Time they should have fresh Air admitted to them, in Proportion to the Warmth of the Season. Towards Michaelmas the Plants must be removed into the Stove, and plunged into the Bark Bed, where, during the Winter Season, they should be kept very warm, and must be gently watered twice a Week. In the Spring the Plants should be shifted into Pots a Size larger than the former, and the Bark Bed should be then renewed with fresh Tan, which will set the Plants in a growing State early, whereby they will make a fine Progress the following Summer. These Plants must be constantly kept in the Stove, for they are too tender to bear the open Air in this Country at any Season.

PERSICA. *Tourn. Inst. R. H. 624. Tab. 402. Amygdalus. Lin. Gen. Plant. 545.* the Peach Tree.

The Characters are,

The Flower has a tubulose Empalement of one Leaf, cut into 5 obtuse Segments which spread open. It hath 5 oblong, oval, obtuse Petals which are inserted in the Empalement, and about 30 erect slender Stamina shorter than the Petals, terminated by single Summits, these are also inserted in the Empalement. It hath a roundish hairy Germen supporting a Style the Length of the Stamina, crowned by a beaded Stigma. The Germen becomes a roundish, woolly, large, succulent Fruit, with a longitudinal Furrow inclosing an oval Nut with a netted Shell, having many Punctures.

There is a great Variety of these Trees, which are cultivated in the Gardens of those who are curious in collecting the several Sorts of Fruit from different Parts of Europe: I shall therefore first beg Leave to mention two of three Sorts, which are cultivated for the Beauty of their Flowers; after which, I shall enumerate the several Varieties of good Fruit which have come to my Knowledge.

1. **PERSICA vulgaris, flore pleno.** *Tourn. Inst. R. H. 625.* Common Peach Tree, with double Flowers.

2. **PERSICA Africana nana, flore incarnato simplic.** *Tourn. Inst. R. H. 625.* Dwarf Almond, with single Flowers, *vulg.*

3. **PERSICA Africana nana, flore incarnato pleno.** *Tourn. Inst. R. H. 625.* Double flowering Dwarf Almond, *vulg.*

The first of these Trees is a very great Ornament in a Garden early in the Spring; the Flowers being very large, double, and of a beautiful red or purple Colour. This may be planted in Standards, and, if intermixed amongst other flowering Trees of the same Growth, makes a very agreeable Variety; or it may be planted against the Walls of the Pleasure Garden, where the beautiful Appearance of its Flowers early in the Spring will be more acceptable in such Places than the choicest Fruits, which must be exposed to Servants, and others, so that they seldom can be preserved in large Families until they are ripe. This Tree may be propagated by budding it on the Almond or Plum Stocks, in the same Manner as the other Sort of Peaches, and should be planted in a good fresh Soil that is not over moist.

The other two Sorts are of humbler Growth, seldom rising above 3 or 4 Feet high; these may be budded upon

Almond Stocks, or propagated by Layers; they will also take upon Plum Stocks, but they are very apt to canker, after they have stood 4 or five Years upon those Stocks, especially that with double Flowers, which is tenderer than the other, which sends out Suckers from the Root, whereby it may be propagated in great Plenty.

These Shrubs make a very agreeable Variety amongst low flowering Trees, in small Wilderness Quarters. The single Sort flowers in the Beginning of April, and the double is commonly a Fortnight later.

I shall now proceed to mention the several Sorts of good Peaches which have come to my Knowledge; and though perhaps a greater Number of Sorts may be found in some Catalogues of Fruits, yet I doubt whether many of them are not the same Kinds called by different Names; for, in order to determine the various Kinds, it is necessary to observe the Shape and Size of the Flowers, as well as the different Parts of the Fruit; for this does sometimes determine the Kind, when the Fruit alone is not sufficient; besides, there is a vast Difference in the Size and Flavour of the same Peach, when planted on different Soils and Aspects; so that it is almost impossible for a Person who is very conversant with these Fruits to distinguish them, when brought from various Gardens.

The present Confusion of the Names of Fruits, hath been many Times owing to the bringing over Trees from France; for the Persons who are generally employed to bring over those Trees for Sale, are entirely ignorant of their various Sorts, and do themselves take them upon Trust, from the Persons who make it their Business to propagate great Quantities, to supply the Markets of France, whither they are brought in Waggon, and sold out in Parcels to those Persons who bring them into England. It also happens many Times, if they are received by right Names, that these in Length of Time are lost, or the Trees come into the Possession of other Persons, who not knowing the true Name of the Fruit, often give them new Names, whereby there is such a Confusion in the Names of Fruit, as is impossible to rectify; and hence some Persons have supposed a much greater Variety of Peaches than there is in Reality, though as the greatest Part of these have been obtained from Seeds, so their Varieties may be multiplied annually, until there be no End of the Sorts. However, I shall content myself with enumerating the principal Sorts now known in England, which are sufficient for any Gentleman to make a Collection to continue through the whole Season of Fruit.

1. The white Nutmeg (called by the French, *L'Avant Pêche Blanche*;) This Tree has sawed Leaves, but generally shoots very weak, unless it is budded upon an Apricot Stock; the Flowers are large and open, the Fruit is small and white, as is also the Pulp at the Stone, from which it separates; it is a little musky and fugary, but is only esteemed for its being the first Sort ripe. It is in eating pretty early in July, and soon becomes mealy.

2. The red Nutmeg (called by the French, *L'Avant Pêche de Troyes*;) This Tree has sawed Leaves, the Flowers are large and open; the Fruit is larger and rounder than the white Nutmeg, and is of a bright Vermilion Colour; the Flesh is white, and very red at the

the Stone; it has a rich musky Flavour, and parts from the Stone. This Peach is well esteemed, it ripens toward the End of July.

3. The early or small *Mignon* (called by the French, *La Double de Troyes*, or *Mignonette*;) This Tree has small contracted Flowers, the Fruit is of a middling Size, and round; it is very red on the Side next the Sun; the Flesh is white, and separates from the Stone, where it is red; the Juice is vinous and rich. It is ripe the End of July, or Beginning of August.

4. The yellow *Alberge*: This Tree has smooth Leaves; the Flowers are small and contracted; the Fruit is of a middling Size, somewhat long; the Flesh is yellow and dry; it is seldom well flavoured, but should be perfectly ripe before it is gathered, otherwise it is good for little. It is ripe early in August.

5. The white *Magdalen*: This Tree has sawed Leaves; the Flowers are large and open; the Wood is generally black at the Pith; the Fruit is round, of a middling Size; the Flesh is white to the Stone, from which it separates: the Juice is seldom high flavoured; the Stone is very small. This ripens early in August.

6. The early Purple (or, *La Pourprée bâtive*;) This Tree has smooth Leaves; the Flowers are large and open; the Fruit is large, round, and of a fine red Colour; the Flesh is white, but very red at the Stone; is very full of Juice, which has a rich vinous Flavour, and is by all good Judges esteemed an excellent Peach. This is ripe before the Middle of August.

7. The large or French *Mignon*: The Leaves of this Tree are smooth; the Flowers are large and open; the Fruit is a little oblong, and generally swelling on one Side; it is of a fine Colour; the Juice is very sugary, and of a high Flavour; the Flesh is white, but very red at the Stone, which is small. This is ripe in the Middle of August, and is justly esteemed one of the best Peaches; this separates from the Stone. This Sort of Peach is tender, and will not thrive on a common Stock, so is generally budded upon some vigorous shooting Peach, or an Apricot, by the Nursery Men, which enhances the Price of the Trees. But the best Method is to bud this Peach into some old healthy Apricot, which is planted to a South or South-east Aspect, and to cut away the Apricot when the Buds have taken, and made Shoots: Upon some Trees which I have seen, thus managed, there has been a much greater Quantity of fairer, and better flavoured Fruit, than I have ever observed in any other Management, and the Trees have been much more healthy.

8. The *Chevreuse*, or *Belle Chevreuse*: This Tree has smooth Leaves; the Flowers are small and contracted; the Fruit is of a middling Size, a little oblong, of a fine red Colour; the Flesh is white, but very red at the Stone, from which it separates; it is very full of a rich sugary Juice, and ripens toward the End of August. This is a very good Bearer, and may be ranged with the good Peaches.

9. The red *Magdalen* (called by the French about Paris, *Madaleine de Courson*;) The Leaves of this Tree are deeply sawed; the Flowers are large and open; the Fruit is large and round, of a fine red Colour; the Flesh is white, but very red at the Stone, from which it separates; the Juice is very sugary, and of an exquisite

Flavour. The Fruit is ripe the End of August; it is one of the best Sort of Peaches.

10. The early *Newington* (or *Smith's Newington*;) This is very like, if not the same, with what the French call *Le Pavie blanc*. This Tree has sawed Leaves; the Flowers are large and open; the Fruit is of a middling Size, is of a fine red on the Side next the Sun; the Flesh is firm and white, but very red at the Stone, to which it closely adheres. It hath a sugary Juice, and is ripe the End of August.

11. The *Montauban*: This Tree has sawed Leaves; the Flowers are large and open; the Fruit is of a middling Size, of a deep red, inclining to purple next the Sun, but of a pale Colour toward the Wall; the Flesh is melting and white to the Stone, from which it separates, the Juice is rich, and the Tree is a good Bearer. It ripens the Middle of August, and is well esteemed.

12. The *Malta* (which is very like, if not the same, with the *Italian Peach*;) This Tree has sawed Leaves; the Flowers are large and open; the Fruit is of a middling Size, of a fine red next the Sun; the Flesh is white and melting, but red at the Stone, from which it separates; the Stone is flat and pointed; the Tree is a good Bearer. This ripens the End of August.

13. The *Noblest*: This Tree has sawed Leaves; the Flowers are large and open; the Fruit is large, of a bright red next the Sun; the Flesh is white and melting, and separates from the Stone, where it is of a faint red Colour; the Juice is very rich in a good Season. It ripens the End of August.

14. The *Chancellor*: the Leaves of this Tree are smooth; the Flowers small and contracted; the Fruit is shaped somewhat like the *Belle Chevreuse*, but rounder; the Flesh is white and melting, and separates from the Stone, where it is of a fine red Colour; the Skin is very thin, and the Juice very rich. It ripens about the End of August, and is esteemed one of the best Sort of Peaches. This Tree is very tender, and will not succeed on common Stocks, so is budded twice as the *Mignon*; and if budded on Apricots, as was directed for that Sort, will thrive much better than in any other Method.

15. The *Bellegarde* (or as the French call it, the *Gal-lande*;) This Tree has smooth Leaves; the Flowers are small and contracted; the Fruit is very large and round, of a deep purple Colour on the Side to the Sun; the Flesh is white, melting, and separates from the Stone, where it is of a deep red Colour; the Juice is very rich. This ripens the Beginning of September, and is an excellent Peach, but at present not common.

16. The *Lisse* (or as the French call it *La petite Viollette bâtive*;) This Tree has smooth Leaves; the Flowers are small and contracted; the Fruit is of a middling Size, of a fine Violet Colour toward the Sun; the Flesh is of a pale yellow and melting, but adheres to the Stone, where it is very red; the Juice is very vinous. This ripens the Beginning of September.

17. The *Bourdine*: This Tree has smooth Leaves; the Flowers are small and contracted; the Fruit is large, round, and of a fine red Colour next the Sun; the Flesh is white, melting, and separates from the Stone, where it is of a fine red Colour; the Juice is vinous and rich; this ripens the Beginning of September, and is greatly esteemed

esteemed by the Curious. The Tree bears plentifully, and will produce Fruit in Standards very well.

18. The *Rossana*: This Tree has smooth Leaves; the Flowers are small and contracted; the Fruit is large, a little more long than the *Alberge*; the Flesh is yellow, and separates from the Stone, where it is red; the Juice is rich and vinous. This ripens the Beginning of September, and is esteemed a good Peach. This is the same with what some call the purple, and others the red *Alberge*, it being of a fine purple Colour on the Side next the Sun.

19. The *Admirable*; This Tree hath smooth Leaves; the Flowers are small and contracted; the Fruit is large, round, and red on the Side next the Sun; the Flesh is white, melting, and separates from the Stone, where it is of a deep red Colour; the Juice is sugary and rich. This ripens the Beginning of September. This is by some called the early *Admirable*, but is certainly what the French call *L'Admirable*, and they have no other of this Name which ripens later.

20. The old *Newington*: This Tree has sawed Leaves; the Flowers are large and open; the Fruit is fair and large, of a beautiful red Colour next the Sun; the Flesh is white, melting and closely adheres to the Stone, where it is of a deep red Colour; the Juice is very rich and vinous. This is esteemed one of the best Sort of *Pavies*. It ripens about the Middle of September.

21. The *Rambouillet* (commonly called the *Rumbullion*): This Tree hath smooth Leaves; the Flowers are large and open; the Fruit is of a middling Size, rather round than long, deeply divided by a Sulcus or Furrow in the Middle; it is of a fine red Colour next the Sun, but of a light yellow next the Wall; the Flesh is melting, of a bright yellow Colour, and separates from the Stone, where it is of a deep red Colour; the Juice is rich, and of a vinous Flavour. This ripens the Middle of September, and is a good Bearer.

22. The *Bellis* (which I believe to be what the French call *La Belle de Vitry*): The Leaves of this Tree are sawed; the Flowers are small and contracted; the Fruit is of a middle Size, round, and of a pale red next the Sun; the Flesh is white, and adheres to the Stone, where it is red; the Juice is vinous and rich. This ripens in the Middle of September.

23. The *Portugal*: This Tree has smooth Leaves; the Flowers are large and open; the Fruit is large, and of a beautiful red Colour towards the Sun; the Skin is generally spotted; the Flesh is firm, white, and closely adheres to the Stone, where it is of a faint red Colour; the Stone is small, but full of deep Furrows; the Juice is rich and vinous. This ripens the Middle of September.

24. *La Teton de Venus* (or *Venus's Breast*), so called from its having a rising like a Dug, or Bubby: This Tree has smooth Leaves; the Flowers are small and contracted; the Fruit is of a middling Size resembling the *Admirable*, of a pale red Colour next the Sun; the Flesh is melting, white, and separates from the Stone, where it is red; the Juice is sugary and rich. This ripens late in September.

25. *La Pourprée* (or as the French call it *Pourprée tardive*, i. e. the late Purple); this Tree has very large

Leaves, which are sawed; the Shoots are very strong; the Flowers are small and contracted; the Fruit is large, round, and of a fine purple Colour; the Flesh is white, melting, and separates from the Stone, where it is red; the Juice is sugary and rich. This ripens late in September.

26. The *Nivette*: This Tree has sawed Leaves; the Flowers are small and contracted; the Fruit is large, somewhat longer than round, of a bright red Colour next the Sun, and of a pale yellow on the other Side; the Flesh is melting, and full of a rich Juice and is very red at the Stone, from which it separates. This is esteemed one of the best Peaches; it ripens in the Middle of September.

27. The *Royal* (*La Royale*): This Tree hath smooth Leaves; the Flowers are small and contracted; the Fruit is large round, and of a deep red on the Side next the Sun, and of a paler Colour on the other Side; the Flesh is white, melting, and full of a rich Juice; it parts from the Stone, where it is of a deep red Colour. This ripens the Middle of September, and, when the Autumn is good, is an excellent Peach.

28. The *Perfique*: This Tree has sawed Leaves; the Flowers are small and contracted; the Fruit is large, oblong, and of a fine red Colour next the Sun; the Flesh is melting, and full of a rich Juice; it separates from the Stone, where it is of a deep red Colour. The Stalk has a small Knot upon it; this makes a fine Tree, and is a good Bearer; it ripens the End of September. Many Gardeners call this the *Nivette*.

29. The monstrous *Pavy* of *Pomponne* (called by the French *La Pavie rouge de Pomponne*); the Leaves of this Tree are smooth; the Flowers are large and open; the Fruit is very large and round; many Times fourteen Inches in Circumference; the Flesh is white, melting, and closely adheres to the Stone, where it is of a deep red Colour; the Outside is a beautiful red next the Sun, and of a pale Flesh Colour on the other Side. This ripens the End of October, and, when the Autumn is warm, is an excellent Peach.

30. The *Catbarine*: This Tree hath smooth Leaves; the Flowers are small and contracted; the Fruit is large, round, and of a dark red Colour next the Sun; the Flesh is white, melting and full of a rich Juice. It closely adheres to the Stone, where it is of a deep red Colour; it ripens the Beginning of October, and in very good Seasons is an excellent Peach, but being so very late ripe, there are not many Situations where it ripens well.

31. The *Bloody Peach* (called by the French *La Sanguinolle*): This Peach is of a middling Size, of a deep red next the Sun; the Flesh is of a deep red quite to the Stone, and from thence is, by some Gardeners called the *Mulberry Peach*. This Fruit rarely ripens in England, so is not often planted, but it bakes and preserves excellently; for which, as also the Curiosity, one or two Trees may be planted, where there is Extent of Walling.

There are some other Sorts of Peaches which are kept in some of the Nurseries, but those which are here enumerated, are the Sorts most worth planting, and in the List the choicest only should be planted; but I

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shall just mention the Names of those Sorts omitted, for the Satisfaction of the Curious.

The *Sinn*; the *Bourdeaux*; the *Swalcb* or *Dutch*; the *Carlisle*; the *Eton*; the *Pêche de Pau*; yellow Admirable; the double Flower. This last Sort is generally planted more for the Beauty of the Flowers, than for the Goodness of the Fruit; of which some Years the Standard Trees produce great Plenty; but they are late ripe, and have a cold, watery insipid Juice. The Dwarf Peach is also preserved as a Curiosity. This is a very tender Tree, making very weak Shoots, which are very full of Flower Buds. The Fruit is not so large as a Nutmeg, and not good, nor will the Tree last any Time, so it is not worth cultivating.

And indeed from these 31 Sorts above-named there are not above ten which I would advise to be planted; because, when a Person can be furnished with those which are good, or has the best of the Season, it is not worth while to plant any which are middling or indifferent, for Variety; therefore the Sorts, which I should prefer, are these after-mentioned.

The early Purple; the *Grosse Mignon*; *Belle Chevreuse*; red *Magdalen*; Chancellor; *Bellegarde*; *Bourdine*; *Rossanna*; *Rambouillet*, and *Nivette*. These are the Sorts best worth planting; and, as they succeed each other, they will furnish the Table through the Season of Peaches; where there is Room, and the Situation very warm, one or two Trees of the *Catharine* Peach should have Place; for in very warm Seasons it is an excellent Fruit.

The *French* distinguish those we call Peaches into two Sorts, *viz* Pavies and Peaches; those are called Peaches which quit the Stone, and those, whose Flesh closely adheres to the Stone, are called Pavies. These are much more esteemed in France than the Peaches, though in *England* the latter are preferred by many Persons.

The *French* also distinguish them into male and female; the Pavies they make to be the male, and the Peaches the female; but this Division is without Foundation, since the Kernels of both Sorts will produce Trees equally, for the Flowers of Peach Trees are generally hermaphrodite, and have all the Parts of Generation in them, so that there is no Necessity for supposing any of them to be entirely male or female: but it is likely, this Distinction is of long standing, before Persons had a perfect Notion of male and female Plants, or at least they did not know how to distinguish them asunder.

The *Nectarines* in another Place are by the *French* called *Brugnons*, which differ from the other two Sorts, in having a firm hard Flesh, and the Skin quite smooth, without any Down upon them. The Sorts of these I have already mentioned under the Article *Nectarines*, to which the Reader may readily turn.

I shall now set down the good Qualities of Peaches; by which any Person may Judge of their Worth.

A good Peach ought to have a firm Flesh; the Skin should be thin, of a deep or bright red Colour next the Sun, and of a yellowish Cast next the Wall. The Flesh should be of a yellowish Colour, full of Juice, which should be high-flavoured; the Stone small, and the Pulp or Flesh very thick. When a Peach hath all these Qualities, it may be esteemed a valuable Fruit.

All the different Sorts of Peaches have been originally obtained from the Stones, which, being planted

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produce new Varieties, as do the Seeds of all other Fruits, so that where Persons have Garden enough to allow Room for propagating these Fruits from Seeds, there is no Doubt but many good Sorts may be obtained, which will be better adapted to our Climate, than such as are brought from warmer Countries; though it is true, that there will be many of them good for nothing, as is the Case of most Fruits and Flowers which are produced from Seeds, amongst which there may be some valuable Kinds, superior to those, from whence the Seeds were taken; yet there is always a great Number which are little worth; but if we can obtain only 2 or 3 valuable Sorts, it is sufficient to make amends for the Trouble of raising them; Where Persons are so curious as to plant the Stones of these Fruits, great regard should be had to the Sorts, and if the Fruits were permitted to remain on the Trees until they dropped off, the Kernels would be fitter for planting, and more likely to grow. The best Sorts for sowing are those whose Flesh is firm, and cleaves to the Stone; from amongst these you should choose such as ripen pretty early, and have a rich vinous Juice; from which Sorts some good Fruit may be expected.

These Stones should be planted in Autumn, on a Bed of light dry Earth, about 3 Inches deep, and 4 Inches asunder, and in Winter the Beds should be covered, to protect them from Frost, which if permitted to enter deep into the Ground, will destroy them. In Spring when the Plants come up, they should be carefully cleared from the Weeds, which should also be observed throughout the Summer; and if the Spring should prove very dry, if you refresh them now and then with a little Water, it will greatly promote their Growth. In this Bed they should remain until the following Spring, when they should be carefully taken up, so as not to break their tender Roots and transplanted into a Nursery, in Rows 3 Feet asunder, and one Foot distant Plant from Plant in the Rows, observing to lay a little Mulch upon the Surface of the Ground about their Roots, to prevent its drying too fast; and if the Spring should prove very dry, you should give them a little Water once a Week, until they have taken Root; after which, they should be constantly kept clear from Weeds, and the Ground between the Rows carefully dug every Spring to loosen it, that the tender Fibres may strike out on every Side.

In this Nursery they may continue one or two Years according to the Progress they make; after which they should be transplanted where they are to remain, to produce Fruit.

In removing these Trees, you should observe to prune their downright Roots (if they have any) pretty short, and to cut off all bruised Parts of the Roots, as also all the small Fibres, which generally dry, and, when left upon the Roots after planting again, grow mouldy, and decay, so that they are injurious to the new Fibres which are shot out from the Roots, and very often prevent the Growth of the Trees; but you should by no means prune their Heads, for the Plants, which are produced from Stones, are generally of a more spongy Texture, and so more liable to decay when cut, than those which are budded upon other Stocks. Besides, as these Trees are designed for Standards (for it is not proper

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per to plant them against Walls, until you see the Produce of the Fruit, to shew which of them deserves to be cultivated,) they will never require any other pruning, but only to cut out decayed Branches, or such as shoot out very irregular from the Sides, for more than this is generally very injurious to them,

In planting these Trees, it will be the better Way to dispose them singly in the Quarters of the Kitchen Garden, where they will thrive, and produce Fruit much better than if they are planted pretty near each other in Rows; and, as they are thus singly disposed, they will not do much injury to the Crops which grow under them.

When they have produced Fruit, you will soon be a Judge of their Goodness, therefore such of them as you dislike, may be destroyed, but those which are good, may be propagated by inoculating them upon other Stocks, which is the common Method now practised to propagate these Fruits; therefore I shall now proceed to treat of that more particularly; in doing of which, I shall set down the Method now commonly practised by the Nursery Gardeners, and then propose some few Things of my own as an Improvement thereon, for such Persons who are very curious to have good Fruit. But, first,

You should be provided with Stocks of the Muscle and white Pear Plums, which are generally esteemed the two best Sorts of Plums for Stocks to inoculate Peaches and Nectarines upon; as also some Almond and Apricot Stocks, for some tender Sorts of Peaches, which will not grow upon Plum Stocks. These should be all produced from the Stone (as hath been already directed in the Article *Nursery*;) and not from Suckers, for the Reasons there laid down. These Stocks should be transplanted, when they have had one Year's Growth in the Seed Bed, for the younger they are transplanted, the better they will succeed, and hereby will be prevented from sending Tap Roots deep in the Ground, for by shortning those Roots, which seem so disposed, it will cause them to put out horizontal Roots. These Stocks should be planted at the Distance above-mentioned, viz. the Rows three Feet asunder, and one Foot apart in the Rows. This is wider than most Nursery Men plant them, but I shall give my Reasons here after for this.

When these Stocks have grown in the Nursery two Years, they will be strong enough to bud; the Season for which is commonly about *Midsummer*, or any Time in *July*, when the Rind will easily separate from the Wood; when you should make choice of some good Cuttings of the Sorts of Fruit you intend to propagate, always observing to take them from healthy Trees, and such as generally produce a good Quantity of well-tasted Fruit; for it is very certain, that any Sort of Fruit may be so far degenerated, where this Care is wanting, as not to be like the same Kind. Besides, whenever a Tree is unhealthy, the Buds taken from that Tree will always retain the Distemper, in a greater or less Degree, according as it hath imbibed a greater or less Quantity of the distempered Juice. Thus, for Instance, where a Peach or Nectarine Tree hath been greatly blighted, so as that the Shoots have grown busied, and the Leaves curled up to a great

Degree, that Distemper is seldom recovered again by the greatest Art, or at least not under several Years Management; for let the Seasons prove ever so favourable, yet these Trees will continually shew the same Distemper, which many Persons are so weak as to suppose a fresh Blight; whereas in Reality it is no other but the Remains of the former Sickness, which are spread and intermixed with all the Juices of the Tree, so that whatever Buds are taken from such Trees, will always retain a Part of the Distemper.

Upon the Care which is taken in the Choice of the Buds, the whole Success depends; therefore a Person, who is curious to have good Fruit, cannot be too careful in this Particular, for, in general, no more is regarded by those Nursery Men who are the most careful in propagating the several Sorts of Fruit Trees, than taking their Buds or Grafts from the true Kinds of Fruit Trees; but there is still more Care required to have sound healthy Trees, especially in this of Peach and Nectarines; for if the Buds are taken from young Plants in the Nursery, which have not produced Fruit, the Shoots of which are generally very strong and vigorous, these Buds will have so vicious a Habit, as rarely to be corrected, and brought into good Order; for they will shoot more like the Willow than the Peach, the Joints being extended to a great Distance from each other, the Shoots very gross, and the Wood pithy; therefore, where the Practice of taking the Buds from Nursery Trees is long continued, there can be little Hopes of the Trees so raised. I would therefore recommend it to every curious Person, to procure their Buds from such Trees as have been long growing, whose Fruit are well-flavoured, and the Trees perfectly sound; as also never to make Choice of the strongest or most luxuriant Shoots of these Trees, but such Shoots as are well-conditioned, and whose Buds grow pretty close together. And although these do not make so strong Shoots the following Year, as those which are taken from luxuriant Branches, yet they will be better disposed to bear Fruit, and will make much better Trees.

The Cuttings, with which you are thus to be provided, should always be taken from the Trees either in a Morning or Evening, or else in a cloudy Day; for if they are cut off when the Sun is very hot, the Shoots will perspire so freely, as to leave the Buds destitute of Moisture, which is often the Cause of their miscarrying; and the sooner they are used, when cut from the Trees, the better they will take. The Manner of this Operation being fully explained under the Article *Inoculation*, I shall not repeat it here. The Management of these Trees, during their remaining in the *Nursery*, is likewise fully set down under that Article. I shall therefore proceed to give some Directions for the Choice of these Trees, when they are to be procured from a Nursery. The first Care should be to find out a Person of Character to deal with, on whose Integrity you may depend, for having the Trees of those Kinds which you propose, and either see them taken up, or let some Person you can confide in do it for you, because, as most of the Nursery Men have Dealings with each other, if the Person applied to has not the Sort of Fruit desired in

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his own Nursery, he procures them from another; and, if the Gardener, from whom he gets them, is not as honest and careful as himself, it is a great Chance if the Trees prove to be of the right Kinds.

The Trees should be chosen in Autumn before others have drawn out the best; for those, who go first to the Nurseries, if they have Skill, will always draw the finest Plants. In the Choice of the Trees, you should observe the Stocks upon which they have been budded, that they are of the right Sort, whether Plum or Apricot; that they are sound and young; not such as had been budded the preceding Year and failed, nor those which have been cut down. If the Size of the Stock is near that of a Man's Finger, it will be better than if they are larger; these should be clear of Moss or Canker. The Buds should be of one Year's Growth only, and not such as have been cut down in the Spring, and made a second Shoot, nor should those Trees be chosen, whose Shoots are very strong and luxuriant, but such as have clean Shoots of a moderate Size, whose Joints are not too far asunder, and those Trees which stand in the outside Rows, or near the Ends of the Rows, where they have most Air, are generally such; for, where they stand close in the Nursery, their Shoots are drawn up in Length; their Joints are much farther asunder, and their Buds or Eyes are flat; for which Reason I have before advised planting the Stocks at a greater Distance than the Nursery Men generally allow them; and, if a careful discreet Nursery Man would be at the Trouble and Expence of raising his Peach Trees, according to this Method, he would better deserve three Shillings *per* Tree, than one, in the Manner they are usually raised; for, every Person who is at the Expence of building Walls for Fruit, should not think of saving a few Shillings in the Purchase of their Trees; because, if they are bad, or not of the right Kinds, there is a great Loss of Time and Expence to no Purpose, and the Disappointment will be so great, after waiting 3 or 4 Years, as to discourage many from making farther Trials, thinking themselves liable to the same ill Success.

When the Trees are chosen in the Nursery, the next Care must be to have them carefully taken up out of the Ground, so as not to break or tear their Roots, nor injure their Bark; for, as these Trees are very apt to gum in those Places where they are wounded, there cannot be too much Care taken of this. If the Trees are to be transported to a distant Place, their Roots should be closely wrapped either with Haybands, Straw, or Pease Haulm, and Mats sewed over these, to prevent the Air from crying their Roots and Branches. If the Leaves of the Trees are not fallen when they are taken up, they should be carefully stripped off, before the Trees are packed up; for when there are many of these left, they are very apt to heat, if they are long in their Passage, and often occasion a Mouldiness very hurtful to the Branches.

We come next to preparing the Ground to receive the Trees. The best Earth for Peach Trees is such as is taken from a Pasture Ground, that is neither too stiff and moist, nor over dry, but of a middling Nature; such as is termed Hazel Loam. This should be dug from the Surface of the Ground about ten Inches deep, taking the Turf with it, and should be laid in Heaps

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eight or ten Months at least; but that which is prepared one Year or more is still better before it be used, that it may have the Winter's Frost, and Summer's Heat to mellow it, during which Time it should be often turned, to rot the Turf, and break the Clods, whereby it will be rendered very light, and easy to work, and about the Beginning of *September* you should carry it into the Garden, and make the Borders, which must be raised in Height, proportionable to the Moisture, of the Garden; but if the Ground be very wet, it will be advisable to lay some Rubbish in the Bottom of the Border, to drain off the Moisture, and to prevent the Roots of the Trees from running downward; and in this Case it will be proper to make some Under-Drains at the Bottom of the Border, to convey off the superfluous Moisture, which, if detained about the Roots of the Trees, will greatly prejudice them; then raise the Border of Earth at least a Foot, or in very wet Land two Feet, above the Level of the Ground, so that the Roots of the Trees may always remain dry; but if the Ground be pretty dry, the Borders should not be raised above six or eight Inches higher than the Surface, which will be sufficient to allow for their sinking.

As to the Breadth of these Borders, that cannot be too great; but they should never be less than 6 or 8 Feet broad, where Fruit Trees are planted, for when the Borders are made very narrow, the Roots of the Trees will be so confined in 4 or 5 Years Time, that they will seldom thrive well after. The Depth of these Borders should not be greater than two Feet and a Half; for where they are prepared to a great Depth, it only intices the Roots of the Trees downward, which may be the Cause of their future Barrenness, for their Roots, being got down below the Influences of the Sun and Showers, imbibe a great Quantity of crude Juices, which only add to the luxuriant Growth of the Trees, and destroy their Fruitfulness; besides, whatever Fruit are produced from such Trees, are not near so well-tasted, as are those which grow upon those Trees, whose Roots lie near the Surface, and enjoy the kindly Benefit of the Sun's Heat to correct and digest whatever Crudities there may be in the Earth.

Where the natural Soil of the Garden is shallow, and either Chalk, Clay, or Gravel lies near the Surface, these should not be dug out to make Pits to receive the Earth for the Border, as is by some practised, for this will be no better than planting the Trees in Tubs or Cases, for their Roots will be confined to these Pits; so that when they are extended to the Sides, and can get no farther, the Trees will blight and decay, and if it is Clay on the Sides, the Wet will be detained as in a Basin, and the Earth of the Border will be like Mud in very wet Seasons, so unfit for the Roots of these Trees. Therefore, whenever it so happens that the Ground is of either of the Sorts before-mentioned, it will be the best Way to raise the Borders of a proper Thickness of good Earth over these, rather than to sink down into them; for when the Roots of the Trees lie near the Surface of the Ground, they will extend to a great Distance in Search of Nourishment, but if they get below the Staple of the Land, they can find nothing but four crude Pasture very unfit for Vegetation.

Your Borders being thus prepared should lie about three Weeks or a Month to settle, by which Time the

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Season for planting will be come, which should be performed as soon as the Leaves begin to decay, that the Trees may put out new Roots, before the Frost comes on to prevent them. Your Ground being ready, and the Trees brought carefully to the Place, the next Work is to prepare them for planting, which is to be performed in the following Manner: You must shorten all the Roots, and cut off smooth any broken or bruised Roots, as also all the small Fibres should be taken off, for the Reasons before given, and where any of the Roots cross each other, the worst of them must be cut out, that they may not injure the other.

And having thus prepared your Trees, you should measure out their Distance, which ought never to be less than 12 Feet; but where the Ground is very good, they should be planted 14 Feet asunder. This, I doubt not, will be thought too great a Distance by many Persons, especially since it is contrary to the general Practice at this Time; but I am satisfied, whoever shall try the Experiment, will find it no more than is sufficient for these Trees, where they are rightly managed; for if they take kindly to the Soil, their Branches may be so trained, as to furnish all the lower Part of the Wall in a few Years, which is what should be principally regarded and not, as is too often the Practice, run up the Shoots in Height, and leave all the lower Part of the Tree destitute of bearing Wood, so that in a few Years there will not be any Fruit but upon the upper Part of the Trees; which also must be the Case where they are planted too close, because there being no Room to extend the Branches on either Side, they are obliged to lead them upright, which produces the before-mentioned ill Effect.

There may be also some, who think this Distance too small for these Trees, because Plums, Cherries, and most other Sorts of Fruit Trees require much more Room; but when it is considered, that Peach and Nectarine Trees produce their Fruit only upon the former Year's Wood, and not upon Spurs, as Cherries, Plums, and Pears do; so that the Shoots of these Trees must be annually shortened in every Part of them, to obtain bearing Wood, therefore the Trees may be kept in much less Compass than those of any other Sort of Fruit, and thereby every Part of the Wall may be constantly supplied with bearing Branches; for when the Trees are planted at a great Distance, the Branches are often extended to such Lengths, as to leave the Middle of the Trees naked, for there are never any good Shoots produced from the old Branches of these Trees.

And here I cannot help taking Notice of another very great Error in planting Wall Fruit, which is the placing Standard or half Standard Trees between the others, to cover the upper Part of the Wall, and to produce Fruit, until the Trees underneath are grown up sufficient to furnish the Walls, when the Standards are to be taken away. This is done without considering that the greater Number of Trees, which are planted in a small Compass, the less Nourishment they can receive, and so consequently must be the weaker, for the same Space of Ground cannot nourish twenty Trees equally as well as it could ten; so that whatever Strength the Standard Trees may have, the Dwarfs will be proportionably weaker, and it is a common Observation that most Trees extend their Roots as far under Ground, as their

Branches spread above Ground, so that there should always be the same allowance given to the Wall Trees, if we would have them strong and vigorous; therefore the building very high Walls for Fruit unless for Pears is to no Purpose, for a ten or twelve Foot Wall will be sufficient for most Sorts of Fruit. I have seen Gardens planted with Fruit Trees by Persons of great Esteem for their Skill in this Art, where Peach and Nectarine Trees have been placed against Walls exposed to the East and West, but could never see any of the Fruit on those Trees come to Perfection; for which Reason I would caution every Person never to follow such Examples, because it is well known that the best aspected Walls do barely ripen many of the latter Peaches some Years; therefore the only Aspect, to which these Trees should be exposed is South, or with a Point or two to the East, and some Sorts may do well, if they are a Point or two to the West.

In the Disposition of the Trees, it will not be amiss to plant those Sorts of Peaches near each other, which ripen about the same Time, for by so doing, the Fruit may be the better guarded from Men and Insects, and this will save a great Deal of Trouble in gathering the Fruit; for if a Person is obliged to go from one Part of the Garden to another, or perhaps to look over all the Walls of the Garden every Time the Fruit is gathered, it is a great Loss of Time, which may be avoided by this first Care in planting the Trees.

But to return to planting; after you have marked out the Places where each Tree is to stand, you must with your Spade make a Hole wide enough to receive the Roots of the Tree, then you should place it down, observing to turn the Bud outwards, that the wounded Part of the Stock may be hid, and let the Stem of the Tree be placed about 4 or 5 Inches from the Wall, with its Head inclining thereto; then fill in the Earth with your Hands, observing to break the Clods, that the Earth may fall in between the Roots, so as no void Spaces may be left about them. You should also gently shake the Tree with your Hands, to settle the Earth down the better between the Roots; then with your Foot gently press down the Earth about the Stem, but do not tread it down too hard, which is many Times a very great Fault; for when the Ground is inclinable to bind, the treading of it close doth often render the Ground so hard, as that the tender Fibres of the Roots cannot strike into it, whereby the Tree remains at a Stand for some Time, and if the Earth be not loosened in Time, it frequently dies; so that whenever you observe the Earth of your Borders to be bound, either by great Rains, or from any other Cause, you should dig and loosen it again, observing always to do it in dry Weather, if in Winter or Spring; but in Summer it should be done in a moist Season.

Although I have here given Directions for the Choice of Trees from the Nursery, after the usual Method of planting these Trees, which is that of taking such as have made one Year's Shoot, yet I would prefer those which were budded the preceding Summer, and have made no Shoot; for if the Bud is found and plump, and the Bark of the Stock well closed, where the Bud is inserted there will be no Danger of its growing, and when the Bud has made a Shoot the following Spring the Length

Length of five or six Inches; if it is stopped by pinching off the Top, it will put out lateral Branches, which may be trained to the Wall, and this will prevent any cutting off the Head, as must be done to those Trees which have had one Year's Growth in the Nursery; for those Trees do not care for those large Amputations, especially some of the more tender Sorts; and by this Method of planting these Trees in Bud, no Time will be lost, when it is considered that the Trees, which have shot, must be cut down, and there is a Hazard of their shooting again; therefore I am convinced from Experience, that it is the best Method.

After you have thus planted your Trees, which have made their Shoots in the Nursery, you should fasten their Heads to the Wall, to prevent their being shaken by the Wind, which would disturb their Roots, and break off the tender Fibres soon after they were produced, to the no small Prejudice of the Trees; you should also lay some Mulch upon the Surface of the Ground about their Roots, before the Frost sets in, to prevent it from penetrating the Ground, which would injure, if not destroy, the small Fibres; but this Mulch should not be layed upon the Ground too early, lest it prevent the autumnal Rains from penetrating to the Roots.

These Things being duly observed, they will require no farther Care till the Beginning or Middle of *March*, according as the Season is earlier or later; you must cut off the Heads of the new-planted Trees, leaving only four or five Eyes above the Bud; in doing of which, you must be very careful not to disturb their Roots; to prevent which, you should place your Foot down close to the Stem of the Tree, and take fast hold of that Part of the Stock below the Bud with one Hand, to hold it steady, while with the other Hand you gently slope off the Head of the Tree with a sharp Knife at the intended Place, which should always be just above an Eye; this should always be done in dry Weather, for if there should be much Rain soon after it is done, there will be some Danger that the Wet will enter the wounded Part, and damage the Tree; nor should it be done in frosty Weather, for the same Reason; for that would enter the wounded Part, and prevent its healing over. After you have headed the Trees, you should gently loosen the Earth of the Borders, to admit the Fibres of the Roots; but you must be very careful in doing of this, not to cut or bruise their new Roots, which would also damage them; and if the Mulch which was laid about their Roots in Autumn be rotten, you may dig it into the Border at some Distance from the Roots of the Trees; and when the dry Weather comes on, you should pare off some Turf from a Pasture Ground, which should be laid upon the Surface of the Border about the Roots of the Trees, turning the Grass downward, which will preserve a gentle Moisture in the Earth, better than any other Sort of Mulch; and this will not harbour Insects, as most Sorts of Dung and Litter do, to the no small Detriment of the Trees.

Those Trees which are planted in Bud, and have not made any Shoots, should have their Stocks cut down at this Season just above the Bud, for the Buds will rarely shoot unless this is performed; and the nearer they are cut to the Bud, the sooner will the Head of the Stock

be covered by the Buds; for although it may be necessary to leave a Part of the Stock above the Bud, in those Trees which are in the Nursery, to which the Shoots made by the Buds may be fastened, to prevent their being broken by the Wind, yet as these are placed against the Wall, to which the Shoots may be fastened, there will be no want of the Stock.

In watering these new planted Trees, which should not be done unless the Spring proves very dry, you should observe to do it with a Nessel upon the Watering Pot, so as to let it out in Drops; for when it is hastily poured down, it causes the Ground to bind; and if you water over the Head of the Tree, it will be of great Service. Your Waterings should not be repeated too often, nor given in great Quantity, both which are very injurious to new planted Trees.

In the Middle of *May*, when these Trees will have several Shoots six or eight Inches in Length, you should nail them to the Wall; observing to train them horizontally, rubbing off all fore-right Shoots, or such as are weak, whereby those which are preserved will be much stronger; but if there are not more than two Shoots produced, and those very strong, you should at the same Time nip off their Tops, which will cause each of them to push out two or more Shoots, whereby the Wall will be better supplied with Branches; you must also continue to refresh them with Water in dry Weather, during the whole Season, otherwise they will be apt to suffer; for their Roots having but little Hold of the Ground the first Year after transplanting, if the Season should prove very dry, it will greatly retard their Growth, if due Care be not taken to water them.

In the Beginning of *October*, when you observe the Trees have done shooting, you should prune them; in doing of which, you must shorten the Branches in Proportion to the Strength of the Tree; which, if strong, may be left 8 Inches long, but if weak, should be shortened to 4 or 5; then you should train them horizontally to the Wall (as was before directed,) so that the Middle of the Trees may be void of Branches, for that Part of the Tree will be easily furnished with Wood afterwards; whereas, if the Shoots are trained perpendicularly to the Wall, those which are the strongest will draw the greatest Share of the Sap from the Roots, and mount upwards; so that the Side Branches will be deprived of their Nourishment and grow weaker, until they many Times decay; and this is the Reason, that we see so many Peach Trees with one or two upright Shoots in the Middle, and the two Sides wholly unfurnished with Branches, whereby the Middle of each Tree cannot produce any Fruit, that being filled with large Wood, which never produces any bearing Shoots. Nor can the two Sides of the Trees be regularly filled with fruitful Branches, when this Defect happens to them; therefore this Method should be carefully observed in trained up young Trees, for when they are permitted to run into Disorder at first, it will be impossible to reduce them into a regular healthful State afterwards, the Wood of these Trees being too soft and pithy to admit of being cut down (as may be practised on many hardy Fruit Trees, which will shoot out vigorously again;) but these will gum at the Places where they are wounded, and in a few Years entirely decay.

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The Summer, following, when the Trees begin to shoot, you should carefully look over them, to rub off all fore-right Buds, or such as are ill placed, and train those which are designed to remain horizontally to the Wall, in their due Order as they are produced, for this is the principal Season when you can best order the Trees as you would have them; whereas, if they are neglected until *Midsummer*, as is the common Practice, a great Part of the Nourishment will be exhausted by fore-right Shoots, and other useless Branches, which must afterwards be cut off; and hereby the remaining Shoots will be rendered very weak, and perhaps some Part of the Wall be entirely unfurnished with Branches; which might have been easily supplied in the Beginning of *May*, by stopping some of the stronger Shoots in such Parts of the Tree where there is a Necessity for more Branches; which would cause each of them to shoot out two or more Side Branches below the Ends of the Shoots, which may be guided into the vacant Parts of the Tree as they are produced, so as that every Part may be regularly furnished with proper Wood, which is the greatest Beauty and Excellency of Wall Trees, but you should always forbear stopping the Shoots in Summer, where there is not a Necessity for Branches to fill the Wall; for there cannot be a greater Fault committed, than that of multiplying the Number of Shoots, so as to cause a Confusion, whereby the Branches will be too weak to produce good Fruit; besides, when they are too close laid in against the Wall, the Air is excluded from the Shoots by the great Number of Leaves, so that they are never duly ripened; and consequently, what Fruit is produced thereon, cannot be so well tasted as those which are produced upon such Trees where the Shoots receive all the Advantages of Sun and Air to bring them to Maturity.

Thus having set down the Method of training up young Trees, I shall now proceed to their pruning and future Management; which, being the same as with full grown Trees, will serve for general Directions how to manage these Sorts of Fruit.

In the pruning of Peach and Nectarine Trees (which require the same Management) the two following Rules should be strictly observed, *viz.* First, That every Part of the Tree be equally furnished with bearing Wood; and secondly, That the Branches are not laid in too close to each other, for the Reasons before laid down (with some others, which will be hereafter inserted). As to the first, it must be observed, That all these Trees produce their Fruit upon the young Wood, either of the preceding Year, or at most, the two Years Shoots, after which Age they do not bear; therefore the Branches should be shortened so as to cause them to produce new Shoots annually in every Part of the Tree; which cannot be done in the ordinary Method of pruning, where Persons neglect their Trees at the Season when they are most capable of Management, which is in *April, May, and June*; at which Time the luxuriant Growth of Branches may be checked by pinching, and new Shoots produced where they are wanting, by stopping the neighbouring Branches; which Shoots, being produced at that Season, will have Time enough to ripen and gain Strength, before the Autumn comes on; whereas all those Shoots which are produced after the

Middle of *June*, will be crude and pithy; and though they may sometimes produce a few Blossoms, yet those rarely bring Fruit; nor are the future Branches good which are produced from such Wood, the Vessels being too large to strain the Juices, so that they easily admit of great Quantities of crude Nourishment to pass through them. Therefore those Persons who only regard their Wall Trees at two different Seasons, *viz.* the Winter and *Midsummer* pruning, cannot possibly have them in good Order; for when all the Branches which were produced in the Spring, are permitted to remain until the Middle or latter End of *June* (as is the common Practice), some of the most vigorous will draw the greatest Part of the Nourishment from the weaker Branches, which, when the strong ones are taken off, will be too weak to produce fair Fruit; and hereby the Strength of the Tree is exhausted, to nourish the useless Branches which are annually cut off again; and thus are too many Trees managed, and at the same Time Complaints made of their Luxuriancy; because two or three Shoots, by drawing in the greatest Share of the Nourishment, grow very strong and woody (whereas, if the Nourishment had been equally distributed to a regular Quantity of Branches, there would be no Sign of their too great Strength); until by often cutting off these vigorous Branches, the Trees are either entirely destroyed, or at least rendered so weak as not to be able to produce Fruit; for although by thus weakening the Branches, it is often the Means to produce a good Number of Blossoms (as may many Times be observed also upon autumnal Shoots); yet the utmost of their Strength is spent in expanding the Flowers, so they rarely produce Fruit; and very often the greatest Part of the Branches die soon after, which is supposed to be occasioned by a Blight, when in Reality it is nothing less than the Fault of those who have the Management of the Trees. It is therefore of the greatest Consequence to Wall Trees, especially of these Sorts, to go over them 2 or 3 Times in the Month of *May*, to rub off all irregular Shoots, and to train in the Branches that are left in due Order to the Wall, that each Shoot may have an equal Advantage of Sun and Air, both of which are absolutely necessary to ripen and prepare the Wood for the next Year's bearing; therefore the oftener the Trees are looked over to divest them of these useless Branches, from the Time they first begin to shoot in the Spring till the Autumn, the better will the Wood be ripened for the succeeding Year.

And by duly observing this in Summer, there will not be Occasion for so much cutting, as is often practised on Peach Trees, to their great Injury; for their Wood Branches are generally soft, tender, and pithy, which, when greatly wounded, are not healed over again so soon as many other Sorts of Trees; and the Wet insinuating into the wounded Parts, doth often cause the Branches to canker and die; which may be entirely avoided by the gentle, easy Method of pinching and rubbing off the Buds in the Manner here directed, which never makes any Wounds on the Tree, and hereby a vast deal of Labour is saved; for one Person who is ready at this Business, will go over a great Quantity of Walling in a Day; whereas if the Trees are permitted to grow rude all the Spring, they will require six

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Times the Labour to reduced them into Order. Besides, it is a great Disadvantage to the Fruit, in permitting the Branches of the Trees to extend from the Wall, and shade them; and when they have grown under the Shelter of these Branches and Leaves all the Spring, until *Midsummer*, then by pruning off and shortening most of these Shoots, and nailing the others close to the Wall, the Fruits are suddenly exposed to the Sun and Air, whereby they receive a very great Check, and are not only retarded in their Growth, but often rendered ill tasted, and have tough Skins.

The Distance which the Branches of these Trees should be allowed against the Wall, must be proportioned to the Size of the Fruit or the Length of the Leaves; for if we observe how the Branches of Trees are naturally disposed to grow, we shall always find them placed at a greater or less Distance, as their Leaves are larger or smaller, as I have already observed under the Article *Leaves*. And there is no surer Guide to a curious Artist than Nature, from whence a Gardener should always be directed in every Part of his Profession, since his Business is to aid and assist Nature, where she is not capable of bringing her Productions to Maturity; or where there is Room, to make considerable Improvements by Art; which cannot be any otherwise effected, then by gently assisting her in her own Way.

But to return to pruning these Trees: The Branches being carefully trained in, as before directed, in the Spring and Summer Seasons, we come now to treat of the Winter pruning, which is commonly performed in *February* or *March*. But the best Season for this Work is in *October*, when their Leaves begin to fall, which will be early enough for their Wounds to heal, before the Frost comes on, so that there will be no Danger of their being hurt thereby; and the Branches of the Trees being proportioned to the Strength of the Roots at that Season, all the ascending Sap in the Spring will be employed to nourish only those useful Parts of the Branches which are left; whereas, if they are left unpruned till *February*, the Sap in the Branches being then in Motion, as may be observed by the swelling of the Buds, the greatest Part of it will be drawn up to the extreme Parts of the Branches, to nourish such Blossoms as must be afterwards cut off; and this may be easily known by observing the strongest Shoots at that Season, when you will find the extreme Buds to swell faster than most of the lower ones; for there being no Leaves then upon the Branches to detain the Sap to nourish the lower Buds, the upper ones will always draw from those below.

But it is a constant Practice amongst Gardeners, founded upon long Experience, to prune weak Trees early in the Winter, and luxuriant Trees late in the Spring, in order to check their Luxuriancy. Now it is evident, that this Check does not proceed from any considerable loss of Sap at the Wounds of the pruned Tree (excepting a few of the bleeding Trees, when cut at that Season,) but must arise from some other Cause; for by several Experiments made by the Rev. Dr. Hales, in fixing mercurial Gauges to the Stems of fresh cut Trees, he found those Wounds were constantly in an imbibing State, except the Vine in the bleeding Season.

When a weak Tree is pruned early in the Beginning of Winter, the Orifices of the Sap Vessels are closed up long before the Spring; and consequently, when in the Spring and Summer, the warm Weather advancing, the attracting Force of the perspiring Leaves is not then weakened by many Inlets from fresh Wounds, but is wholly exerted in drawing Sap from the Root; whereas, on the other hand, when a luxuriant Tree is pruned late in the Spring, the Force of its Leaves to attract Sap from the Root will be much spent and lost, at the several fresh cut Inlets.

Besides, if it were no Advantage to the Trees to prune them at this Season (which I think no one will have Reason to doubt after making the Trial,) but that it only succeeds as well as the Spring pruning; yet there is a great Advantage in doing it at *Michaelmas*, for that being a Season of much more leisure with Gardeners than the Spring, they will have more Time to perform it carefully; and then they will not have too many Things come together, which may require to be immediately executed; for the Spring being the principal Season for cropping their Kitchen Gardens and attending their hot Beds, if they are disengaged from the Business of pruning at that Time, it will be of great Advantage, especially where there is a great Quantity of Walling. And here is also another Benefit in pruning at this Season, which is, the having the Borders at Liberty to dig and make clean before the Spring, so that the Garden may not appear in Litter at that Season.

Having said thus much concerning the Time of pruning, I shall now proceed to give some general Directions how it is to be performed on Peach and Nectarine Trees, which require a very different Management from most other Sorts of Fruits.

In pruning these Trees, always observe to cut them behind a Wood Bud, which may be easily distinguished from the Blossom Buds that are shorter, rounder, and more turgid than the Wood Buds; for if the Shoot have not a leading Bud where it is cut, it is very apt to die down to the next leading Bud; so that what Fruit may be produced above that, will come to nothing, there being always a Necessity of a leading Bud to attract the Nourishment; for it is not sufficient that they have a Leaf Bud, as some have imagined, since that will attract but a small Quantity of Nourishment, the great Use of the Leaves being to perspire away such crude Juices as are unfit to enter the Fruit. The Length you should leave these Branches, should be proportioned to the Strength of the Tree, which, in a healthy strong Tree, may be 10 Inches or more, but in a weak one, they should not be more than 6 Inches; however, in this you must be guided by the Position of a leading Bud, for it is better to leave a Shoot 3 or 4 Inches longer, or to cut it 2 or 3 Inches shorter than we would choose to do, provided there be one of these Buds, it being absolutely necessary for the future Welfare of the Tree; you should also cut out entirely all weak Shoots, though they may have many Blossom Buds upon them; for these have not Strength enough to nourish the Fruit, so as to give it a kindly Flavour, but they will weaken the other Parts of the Tree.

In nailing the Shoots to the Wall, be careful to place them at as equal Distances as possible, that their Leaves, when

when come out, may have Room to grow, without shading the Branches too much; and you should never nail them upright, if it can be prevented; for when they are thus trained, they are very subject to shoot from the uppermost Eyes, and the lower Part of the Shoots will thereby become naked.

There is not any Thing in the Business of Gardening, which has more exercised the Thoughts of the Curious, than how to preserve their tender Sorts of Fruit from being blighted in the Spring of the Year, and yet there has been little written upon this Subject, which is worth Notice: Some have proposed Mattresses of Straw or Reeds to be placed before the Fruit Trees against Walls, to prevent their being blasted; others have directed the fixing horizontal Shelters in their Walls, to prevent the perpendicular Dew or Rain from falling upon the Blossoms, which they supposed to be the chief Cause of their Blighting; but both these Contrivances have been far from answering the Expectations of those who have put them in Practice, as I have elsewhere shewn; therefore it may not be improper to repeat some Things in this Place, which I have before mentioned, in Relation to this Matter. And,

First, I have already said, that the Blights which are so often complained of do not so often proceed from any external Cause or Inclemency in the Season, as from a Distemper or Weakness in the Trees; for if we observe the Trees at that Season, where they are the most subject to what is called a Blight, we shall find the Branches very small, weak, and not half ripened, as also trained in very close to each other; these Branches are, for the most Part, full of Blossom Buds (which is chiefly occasioned by their Want of Strength). These Buds do indeed open, and to Persons not skilled in Fruit Trees, shew a great Prospect of a plentiful Crop of Fruit; whereas the whole Strength of the Branches is spent in nourishing the Flowers, and being unable to do any more, the Blossoms fall off, and the small Efforts of the Leaf Buds are checked, so that many Times the greatest Part of the Branches die away, and this is called a great Blight; whereas at the same Time it may be often observed, that some Trees of a different Sort, nay, even some of the same Sort, which were stronger, though placed in the same Soil, exposed to the same Aspect, and subject to the same Inclemency of Air, have escaped very well, when the weak Trees have appeared to be almost dead; which is a plain Indication, that it proceeds from some Cause within the Tree, and not from any external Blight. All this will therefore be remedied, by observing the forgoing Directions in the pruning and Management of the Trees, so as never to over-burden them with Branches nor to suffer any Part of the Trees to exhaust the whole Nourishment from the Root, which will cause the other Parts to be very weak; but to distribute the Nourishment equally to every Shoot, that there may be none too vigorous, at the same Time that others are too weak; and by continually rubbing off useless or fore-right Shoots as they are produced, the Strength of the Trees will not be spent, to nourish such Branches as must be afterwards cut out, which is too often seen in the Management of these Trees. And,

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Secondly, It sometimes happens, that the Roots of these Trees are buried too deep in the Ground, which, in a cold or moist Soil, is one of the greatest Disadvantages that can attend these tender Fruits; for the Sap contained in the Branches, being by the Warmth of the Sun put strongly into Motion early in the Spring, is exhausted in nourishing the Blossoms; and a Part of it is perspired through the Wood Branches, so that its Strength is lost before the Warmth can reach to their Roots, to put them into an equal Motion in Search of fresh Nourishment, to supply the Expence of the Branches; for want of which, the Blossoms fall off and decay, and the Shoots seem to be at a Stand, until the farther Advance of the Warmth penetrates to the Roots and sets them in Motion; when suddenly after, the Trees, which before looked weak and decaying, make prodigious Progress in their Shoots; and before the Summer is spent, are furnished with much stronger Branches than those Trees which have the full Advantage of Sun and Showers, and that are more fruitful and healthy; which must certainly be owing to the Cause here mentioned, as also to their drawing in a great Quantity of crude Moisture, which, though productive of Wood, is yet unkindly for Fruit: If therefore, this be the Case, there is no Way of helping it, but by raising up the Trees, if they are young; or if they are too old to remove, it is the better Way to root them out and make new Borders of fresh Earth, and plant down young Trees; for it is a great Vexation to be at the Trouble and Expence of pruning and managing these Trees, without having the Pleasure of reaping any Advantage from them, which will always be the Case where the Trees are thus injudiciously planted. Or,

Thirdly, This may proceed from the Trees wanting Nourishment, which is many Times the Case, where they are planted in a hard gravelly Soil, in which it is the common Practice to dig Borders 3 or 4 Feet wide, and 3 Feet deep into the Rock or Gravel, which is filled with good fresh Earth, into which the Trees are planted, where they will thrive pretty well for 2 Years, until their Roots reach the Gravel, where they are confined, as if planted in a Pot; and for want of proper Nourishment, the Branches continually decay every Year. This cannot be helped, where the Trees have been growing some Years, without taking them entirely up, or by digging away the Gravel from their Roots, and adding a large Quantity of fresh Earth, that may afford them a Supply of Nourishment a few Years longer; but Trees so planted, cannot by any Art be continued long in Health.

But if the Unfruitfulness of the Trees does not proceed from any of the before-mentioned Causes, and is the Effect of unkindly Seasons, then the best Method yet known is, in dry Weather, when little Dew falls, to sprinkle the Branches of the Trees gently with Water soon after the blossoming Season, and while the young set Fruit is tender; which should always be done before Noon, that the Moisture may evaporate before the Night comes on; and if in the Night you carefully cover the Trees with Mats, Canvas, or some such light Covering, it will be of great Service to them: However, where the Trees are strong and vigorous, they

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are not so liable to suffer by a small Inclemency, as are those which are weak; so that there will be few Seasons in which there may not be Hopes of a moderate Quantity of Fruit from them, though there should be no Covering used; for where these Coverings are used, if it is not performed with great Care and Diligence, it is much better to have no Covering, but trust to the Clemency of the Season; for if the Coverings are kept too close, or continued too long, the Trees will receive more Injury hereby, than from being constantly exposed; or if after they have been covered for some Time, and then incautiously removed, so as to expose the Trees too suddenly to the open Air, they will suffer more thereby than if they had not been covered. However, I must repeat in this Place what has been before mentioned under another Article, of a Management which has been generally attended with Success, which is, The putting up two Feather-edge Deal Boards joined together, over the Top of the Trees, so as to form a Penthouse to cast off perpendicular Wet. These should be fixed up when the Trees begin to blossom, and should remain till the Fruit is well set, when they should be taken down, to admit the Dew and Rain to the Leaves and Branches of the Trees, which must not be longer kept off; and where the Wall is long, and exposed to Currents of Wind, if at the Distance of forty Feet from each other are fixed some cross Reed Hedges, to project about ten Feet from the Wall, these will break the Force of the Wind, and prevent its destroying the Blossoms; and these may be removed away, as soon as the Danger is over. Where these Things have been practised, they were generally attended with Success; and as there will be no Trouble of covering and uncovering in this Method, after they are fixed up, there can be no Danger of Neglect, as very often is the Case when the Trouble is great, or to be often repeated.

When your Fruit is set, and grown to the Bigness of a small Nut, go over the Trees and thin them, leaving them at least 5 or 6 Inches asunder; for when they are permitted to remain in Bunches, as they are often produced, the Nourishment which should be employed wholly to the Fruits designed to stand, will be equally spent amongst the whole Number, a great Part of which must be afterwards pulled off; so the sooner this is done, the better it will be for the remaining Fruit; and if it should sometimes happen, that a Part of those left, by any Accident, should be destroyed, yet the remaining ones will be much the larger and better tasted for it, and the Trees will gain more Strength, for a moderate Quantity of Fruit is always preferable to a great Crop; the Fruit, when but few, will be much larger, better tasted, and the Trees in a Condition to bear well the succeeding Year; whereas when they are overcharged with Fruit, it is always small, ill tasted, and the Trees are generally so much weakened thereby, as not to be in a Condition for bearing well for 3 or 4 Years after; so that upon the whole, it is much better to have a lesser Number of Fruit than is commonly esteemed a Crop, than to have too many, since the Fruit and also the Trees, are benefited thereby. The Quantity of Fruit to be left on large full grown Trees, should never be greater than five Dozen upon each; but on a middling Trees, three or four Dozen will be enough.

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* If the Season proves hot and dry, it will be proper to draw up the Earth round the Stem of each Tree, to form a hollow Basin of about 6 Feet Diameter; cover the Surface of the Ground in this Basin with Mulch, and once a Week or Fortnight, according to the Heat and Drought of the Season, pour down 8 or 10 Gallons of Water to the Root of each Tree; or where there is an Engine, which will disperse the Water in gentle easy Drops like Rain, if the same, or a larger Quantity of Water, is sprinkled all over the Branches of the Trees, and this, soaking down to the Roots, will keep the Fruit constantly growing; which will prevent their falling off the Trees, as they generally do where this Method is not practised; and the Fruit being thus constantly nourished, will be much better tasted, and the Trees maintained in Vigour; this I can from long Experience recommend, as one of the most necessary Things to be practised by all Lovers of good Fruit. But this should not be continued longer than while the Fruit are growing, for afterward it will be hurtful to the Trees and Fruit, for a dry Autumn ripens both Wood and Fruit better than a moist latter Season.

When the Peach Trees are carefully managed in the Spring of the Year, according to the Rules before laid down, all the Nourishment which the Roots can supply will be usefully employed in nourishing such Shoots only as are to be continued, as also the Quantity of Fruit which is proper for each Tree, therefore both must of Consequence be rendered better; for where there is not this Care, the Trees soon grow ragged, and are not furnished properly with Branches; and those Shoots which are produced, are some very weak, and others very luxuriant, whereby the Trees are rendered very unsightly, as also unhealthy, and never continue many Years fruitful; and by thus training the Branches to the Wall, as they are produced, the Fruit will be always equally exposed to the Sun and Air; which in the common Method of managing these Trees, by letting their Branches grow rude all the Spring, they are deprived of, and consequently do not receive the Benefit from these equal to those which are properly managed; and by the timely rubbing off useless and luxuriant Shoots, it will save much Trouble, and prevent the Use of the Knife in Summer, which is very hurtful to these Trees, for there will be no Need to shorten any of the Shoots in Summer.

When these Rules are duly executed, there will be no Occasion to pull off the Leaves of the Trees, to admit the Sun to the Fruit, which is often practised; for if we consider, that the Leaves are absolutely necessary to cherish the Blossom Buds, which are always formed at the Foot Stalks of the Leaves, the pulling them off before they have performed the Office assigned them by Nature, is doing great Injury to the Trees, therefore I caution every one against that Practice.

It is a common Opinion which has for some Years prevailed, even among Persons of good Understanding. That Peach Trees are not long lived, therefore should be renewed every 20 Years; but this is a great Mistake, for I have eaten some of the finest Peaches of various Kinds, which grew on Trees which had been planted above 50 Years: And I am convinced by Experience, that when the Trees are budded upon proper Stocks, and

and carefully planted and managed, they may be continued fruitful and healthy 60 Years and upward; and the Fruit produced on these old Trees will be much better flavoured, than any of those upon young Trees; but I suppose the Foundation of the above Opinion was taken from the *French*, who generally bud their Peaches upon Almond Stocks, which are of short Duration, these seldom lasting good more than 20 Years; but this being seldom practised in *England*, the Case is widely different; nor indeed should we fetch our Examples from that Nation, where the Professors of the Art of Gardening are at least a Century behind the *English*; and, from their present Disposition, seem unlikely to overtake them; for they depart from Nature in almost every Part of Gardening, and are more pleased with introducing their little Inventions of pruning and managing their Fruit Trees, according to their own Fancy, than they are careful to draw their Instructions from Nature, from whence the true Art is to be obtained; so that in very few Instances Gardiners should deviate from Nature, unless it be in those Particulars, where Art may be practised to the greatest Advantage; which is in the procuring many Sorts of esculent Plants and Fruits, earlier and better flavoured than can be obtained without, in which the *French* are extremely deficient; and herein they trust too much to Nature, and use too little Art.

In one of the most celebrated of their Authors, who treats very particularly of Fruit Trees, there are Directions for planting Peach Trees 12 Feet asunder, and at the same Time he advises the planting of Pear Trees but 9 or 10 Feet Distance; and yet he says, that a Pear Tree in Health, will shoot 3 Feet on each Side every Year; therefore he does not allow Room for these Trees to grow more than 2 Years, before they meet. There is also another Thing positively laid down by the same Author, which is, never to lay any Dung upon the Borders where Fruit Trees are growing, which he says will render the Fruit ill-tasted; and this Opinion has too generally prevailed in *England*; but this hath been exploded by one of his own Country-men, who affirms that from upward of 20 Years Experience those Trees, where the Borders had been constantly dunged, always produced the most delicious Fruit, and the Trees were in the greatest Vigour; and the same Gentleman mentions the Practice of the Gardeners at *Montreuil* near *Paris*, who have for some Generations been famous for the Culture of Peaches; and are as careful to dung the Borders where their Peach Trees grow every other Year, as the Kitchen Gardeners are for their Legumes.

And from a long Experience it is, that I can subscribe to the Truth of this, for in some particular Gardens, where the best Fruit grew that I have yet tasted, the Ground was constantly dunged every other Year; therefore it is what I must recommend to the Practice of every curious Person, with this Caution, always to use such Dung for their Borders, as is well rotted, and to dig it into the Borders in *November*, that the Rain may wash down the Salts before the Spring comes on; and where the Ground is very loose or sandy, it will be the best Way to make Use of Neats Dung, which is cooler than that of Horses, but for cold strong Land the latter is to be preferred.

If the Ground is well trenched every Year about the Roots, it will be of great Service to them, and where the Soil is subject to bind very close, if it is forked 2 or 3 Times in a Year to loosen the Surface, it will greatly help the Trees. The Borders should not be crowded with any large growing Plants, which will draw away the Nourishment from the Trees; therefore when any Sort of Kitchen Herbs are planted on these Borders, they should be only such as are of small Growth, and which may be taken off early in the Spring; and if this is carefully observed, the cultivating small Things on these Borders can do no Harm, because the Ground will be stirred the oftener, on account of these small Crops, than it would have been, when no Use was to be made of the Borders. The Rules here laid down, if properly observed, will direct any curious Person how to have Plenty of good Fruit, also to preserve the Trees in Vigour a great Number of Years.

PERSICARIA. *Tourn. Inst. R. H.* 509. *Tab.* 290. *Polygonum. Lin. Gen. Plant.* 445. Arse-smart.

The Characters are,

The Flower hath no Empalement (or no Petals according to some). It hath one Petal which is permanent, and cut into 5 Segments, which spread open; it has in some Species 5 and in others 6 short Stamina terminated by roundish Summits, and a three-cornered Germen supporting 2 or 3 short slender Styles crowned by single Stigmas. The Germen becomes a roundish acute-pointed Seed wrapped up in the Petal of the Flower.

The Species are,

1. PERSICARIA foliis lanceolatis, floribus hexandris, stylo bifido. Arse smart with Spear-shaped Leaves, Flowers with six Stamina, and a bifid Style. This is the *Persicaria urens* seu *Hydro-piper*. *C. B. P.* 101. Water Pepper, Lake Weed, or Arse-smart.

2. PERSICARIA floribus hexandris digynis, spicis ovatis oblongis, foliis lanceolatis acutis. Arse-smart with Flowers having six Stamina and two Styles, oblong oval Spikes of Flowers, and acute-pointed Spear-shaped Leaves. *Persicaria mitis maculosa*. *C. B. P.* Spotted Arse-smart.

3. PERSICARIA floribus octandris tryginis racemosis, foliis lanceolatis, caule divaricato patulo. Arse-smart with Bunches of Flowers having eight Stamina and three Styles, Spear-shaped Leaves, and spreading Stalks. This is the *Fagopyrum orientale ramosum* & multiflorum, *Persicaria folio*. *Tourn. Cor.* 39. Eastern branching Buckwheat with many Flowers, and an Arse-smart Leaf.

4. PERSICARIA foliis ovato-lanceolatis acutis floribus pentandris, caule erecto. Arse-smart with oval, Spear-shaped, acute-pointed Leaves, Flowers having five Stamina, and an erect Stalk. This is the *Persicaria orientalis, nicotianæ folio, calyce florum purpureo*. *Tourn. Cor.* 38. Eastern Arse-smart with a Tobacco Leaf, and a purple Empalement to the Flower.

There are several other Species of this Genus, some of which grow naturally in *England*, but as they are common Weeds, they are not admitted into Gardens, therefore it would be to little Purpose enumerating them. The two first here mentioned are troublesome Weeds, the first growing in moist Ground by the Sides of Ditches and Ponds in most Parts of *England*; the Roots of this are perennial, and creep far in the Ground, so as to overspread soon a large Tract of Land.

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The other is an annual Plant which grows plentifully on Dunghills, and in moist Ground every where; but as these two Plants are used in Medicine, I have mentioned them here to introduce the other. The first Sort has been accounted an extraordinary Plant against the Stone. Mr. Boyle having in his Book of the Usefulness of experimental Philosophy given a mighty Character of the distilled Juice of this Plant, for its Virtues against that Distemper.

The 3d Sort grows naturally in *Siberia*; this hath a perennial creeping Root composed of many strong ligneous Fibres. The Stalks rise about 3 Feet high, and divide into many confused Branches, which are generally bent at each Joint; these are garnished with narrow Spear-shaped Leaves about 4 Inches long, and half an Inch broad; they are smooth, and of a light green, ending in acute Points. The Flowers are produced in loose Spikes branching out from the End of the Stalks; they are white, and of the same Construction with the other Species, but have 8 Stamina and 3 Styles. It flowers in *June*, and the Seeds ripen in *September*. The Stalks decay in the Autumn, and new ones arise from the Roots in the Spring.

The Seeds of the 4th Sort were sent to *Europe* by Dr. Tournefort, who saw it first growing in the Prince of Teflis's Garden in *Georgia*, and afterwards in the Garden of the Monks of the three Churches near Mount *Ararat*, but he could not learn where it grew naturally. They cultivate this Plant in the Gardens of *Georgia* and *Armenia*, not only for the Beauty of its Flowers, but also for the Virtues, with which the Plant is possessed, which are nearly the same with those attributed to the *European Arse-smart*.

The Plant is annual, decaying with the first Frosts in the Autumn; it rises from the scattered Seeds much better than if sown, but where it is sown, it should always be done in Autumn soon after the Seeds are ripe. The Plants rise with a strong upright Stalk to the Height of 8 or 10 Feet, and grow to the Size of an ordinary walking Stick; the lower Part of the Stalk becomes ligneous and tough; the Joints are like those of the Reed or Cane. At each Joint is placed one Leaf; these stand alternately on the Stalk; the lower Leaves, which are the largest, are often more than a Foot long, and six Inches broad in the Middle, lessening toward each End, and terminating in a long acute Point, having a strong longitudinal Mid-rib with several transverse Veins running from it toward the Edges. The upper Surface is of a bright green, a little hairy, and the under of a pale green, and much more hairy; the lower Leaves have pretty long Foot Stalks, which are broad at the Base, and half surround the Stalks. The upper Part of the Stalk branches out into many Divisions, each being terminated by 2 or 3 close Spikes of purple Flowers, which are 7 or 8 Inches long, and have their Points hanging downward; these Flowers have no Empalement according to Mr. Ray and others, or no Petals according to Tournefort, the former calling the Covers to the Parts of Generation, Petals, if they are coloured, and the latter terminating those Covers, the Empalement, where there are no other, whether they are green or coloured. This Plant begins to shew its Flowers to-

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ward the latter End of *July*, and continues in Beauty till the Frost in the Autumn puts a Stop to them.

The Seeds of this Sort should be sown in Autumn as soon as they are ripe, or if they are permitted to fall on the Ground, the Plants will come up the Spring following better than when they are sown by Art, as was before observed; for if the Seeds are sown in the Spring, it is very rare that any of them succeed, and if some few Plants come up from those Seeds sown at that Season, they seldom grow near so strong as those which are produced, from the Seeds which fell in Autumn; so that there is no other Culture required to this Plant, but to transplant them out in the Spring, where they are designed to stand, which should be in the Borders of large Gardens, giving them great Space; for if they are placed near other Plants, they will shade them entirely from the Sun, and by continually dripping upon them, will greatly injure them, and if they stand too close, their Beauty is greatly diminished.

When the Plants begin to aspire upwards, which is commonly in the Beginning of *July*, their Side Shoots should be pruned off to make them advance in Height, and preserve them within Compass, otherwise they are very subject to branch out widely on every Side, so as to become troublesome to the Plants near them; but when they are pruned up regularly 5 or 6 Feet high, they may afterwards be permitted to shoot out Side Branches, since those, which are produced above that Height, will never be very long or troublesome, but will add to the Beauty of the Plant. This delights in a rich moist Soil, upon which it will grow to a prodigious Height.

PERVINCA. See Vinca.

PETALS are the fine coloured Leaves which compose the most conspicuous Parts of a Flower; these are called in Latin *Petala*, to distinguish them from the Leaves of Plants, which are called *Folia*.

PETASITES. Tourn. Inst. R. H. 451. Tab. 258. Tussilago. Lin. Gen. Plant. 856. Butter-bur.

The Characters are,

It hath a Flower composed of several hermaphrodite Florets, included in one common cylindrical Empalement. These Florets are tubulous or Funnel-shaped, of one Petal cut into 5 Segments at the Brim; they have each 5 small Hair-like Stamina terminated by cylindrical Summits, and a short Germen, crowned with Down, supporting a slender Style crowned by a thick Stigma. The Germen becomes an oblong compressed Seed crowned with a hairy Down.

The Species are,

1. PETASITES *thyrsus ovato sessili, foliis obcordatis angulatis serratis*. Butter-bur with a short oval Spike of Flowers, and Heart-shaped, angular, sawed Leaves. This is the *Petasites major & vulgaris* C. B. P. 197. Common larger Butter-bur.

2. PETASITES *thyrsus fastigiato, scapi crassissimo foliis, foliis inaequaliter serratis, pediculis tenuioribus*. Butter-bur with a close compact Spike, a very thick leafy Stalk, Leaves unequally sawed, and slender Foot Stalks. *Petasites minor* C. B. P. 197. Smaller Butter-bur.

3. PETASITES *foliis cordato-bastatis serratis inferne tomentosis*. Butter-bur with Heart-shaped, Halberd-pointed,

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pointed, sawed Leaves, which are woolly on their under Side. This is the *Petasites minor, folio Tussilaginis*. R. H. Blaff. Smaller Butter-bur with a Coltsfoot Leaf.

4. *PETASITES scaps longissimo, thyrsa oblongo, pedunculis longissimis, foliis cordatis amplioribus*. Butter-bur with a very long Flower Stalk, an oblong Spike of Flowers, the longest Foot Stalks, and the largest Heart-shaped Leaves. *Petasites major, floribus pediculis longis infidentibus*. Raii. Syn. 179. Greater Butter-bur with Flowers sitting on very long Foot Stalks.

5. *PETAISTES scaps subnudo unifloro, foliis cordato-orbiculatis crenatis*. Butter-bur with a Stalk almost naked, having one Flower, and round, Heart-shaped, crenated Leaves. This is the *Petasites monanthos rotundifolius glaber*. Vaill. Aët. Par. 1719. Butter-bur with one Flower, and round smooth Leaves.

The 1st here mentioned is the common Butter-bur or Pestilent Wort, which grows naturally by the Side of Rivers and Ditches in most Parts of England; this hath a Root composed of large fleshy Fibres, as big as a Man's Finger, which creep near the Surface of the Ground, but do not strike deep, nor have they many small Fibres; these have a dark-coloured Skin, but are white within, and have a strong Scent with a hot biting Taste. From these, early in the Spring, arise hollow thick Stalks 5 or 6 Inches high, terminated by an oval Spike of purplish Flowers sitting close to the Stalk. Each Flower is composed of 4 or 5 hermaphrodite Florets inclosed in one common Empalement; these appear in March and when they fade, are each succeeded by one compressed Seed crowned with hairy Down. After the Flowers are past, the Leaves come up, which grow to a large Size, each having a thick Foot Stalk arising immediately from the Root; they are of a roundish Form, cut into Angles on their Edges, and indented at the Foot Stalk like a Heart; they are a little Downy on their under Side; they continue all the Summer, but decay in the Autumn, and come up after the Flowers the following Spring. It is never cultivated in Gardens, but being a medicinal Plant, I have mentioned it.

The Roots of this are sudorifick, alexipharmick, and good for all Kinds of Fevers, and malignant, infectious, and pestilential Distempers; they are cordial, preventing Fainting and Shortness of Breath. A good Quantity of this Root is put into the Treacle Water.

The 4th Sort was found growing naturally in Oxfordshire by Mr. Jacob Bobart Gardener of the Physick Garden at Oxford, who sent it to the Chelsea Garden, where it has grown near 50 Years, and retains its Difference from the common Sort. The Flower Stalks of this are thicker, and rise more than 2 Feet high; the Spikes of Flowers are 9 or 10 Inches long; each Flower stands on long Foot Stalks, the Leaves of the Plant are larger, have longer Foot Stalks than those of the common Sort, and the Flowers come later in Spring. This is kept in Botanick Gardens, to increase the Variety, but is rarely admitted into any other.

The 3 other Sorts grow naturally on the Alps and other mountainous Places in Europe; they are of much less Growth than either of the former, especially the 5th Sort, whose Leaves are small and round. The Flower Stalks are not more than 4 Inches high; they are almost naked, and sustain a single yellowish Flower on the

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Top. The others have short Spikes of Flowers; those of the 2d Sort are collected in little Bunches, and form a thick roundish Spike. but those of the 3d are more like the first.

These Plants are preserved in Botanick Gardens; they delight in a moist Soil and a shady Situation, where their Roots will spread, and propagate fast enough.

PETIVERIA. Plum. Nov. Gen. 50. Tab. 39. Lin. Gen. Plant. 417. Guinea Henweed vulgò.

The Characters are,

The Flower hath a permanent Empalement composed of 5 narrow obtuse Leaves which are equal. It hath 4 small white Petals, placed in Form of a Cross, which soon fall off, and 6 Awl-shaped erect Stamina terminated by single Summits. In the Center is situated an oblong compressed Germen, with 4 Awl-shaped Styles, crowned by obtuse permanent Stigmas. The Germen becomes one oblong Seed, narrow at the Bottom and taper, but broad above, where it is compressed and indented at the Top, resembling an inverted Shield armed with the acute Style, which is reflexed.

We know but one Species of this Plant, viz.

PETIVERIA. Hort. Cliff. 141. This is the *Petiveria solani foliis, loculis spinosis*. Plum. Nov. Gen. 50. *Petiveria* with Nightshade Leaves, and prickly Seed Vessels, commonly called Guinea Henweed.

This Name was given to this by father Plumier who discovered it in America, in Honour of Mr. James Petiver an Apothecary of London and a curious Botanist.

It is a very common Plant in Jamaica, Barbadoes, and most of the Islands in the West-Indies, where it grows in shady Woods, and all the Savannas, in such Plenty, as to become a very troublesome Weed; and as this Plant will endure a great Deal of Drought, it remains green, when other Plants are burned up, which occasions the Cattle to browse on it; and having a most unsavoury strong Scent somewhat like wild Garlick, it gives the Cows Milk the same Flavour, and the Cattle, which are killed soon after feeding on this Plant have a most intolerable Scent, and their Flesh is good for little. The Roots are strong, and strike deep in the Ground; the Stalks rise from 2 to 3 Feet high; they are jointed and become ligneous at Bottom, and are garnished with oblong Leaves 3 Inches long, and an Inch and a Half broad; of a deep green, and veined; these are placed alternately upon short Foot Stalks. The Flowers are produced in slender Spikes at the End of the Branches; they are very small, so make no Figure. They appear in June, and are succeeded by short Seed Vessels, shaped like an inverted Shield, containing one oblong Seed which ripens in Autumn.

In Europe this Plant is preserved in the Gardens of the curious in Botany; but there is little Beauty in it, and having so rank a Scent upon being handled renders it less valuable. It is propagated by Seeds sown on a hot Bed early in the Spring, and when the Plants are come up, they should be each transplanted into a separate Pot, and plunged into a moderate hot Bed to bring them forward. When the Plants have obtained a good Share of Strength, they should be inured to the open Air by Degrees, into which they may be removed toward the latter End of June, placing them in a warm Situation, where they may remain till Autumn, when they should be removed into the Stove, and in Winter must

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must have a moderate Degree of Warmth, otherwise they will not live in this Country.

They will produce Flowers and Seeds every Summer, and will continue several Years, remaining green throughout the Year, and may be propagated by Slips.

PETREA. *Houff. Gen. Nov. Lin. Gen. Plant.* 682.

The Characters are,

The Flower hath an Empalement of one Leaf cut into 5 obtuse Segments almost to the Bottom, which are expanded and permanent. The Flower hath one Petal, having a short Tube, but is cut above into 5 almost equal Segments, which are expanded. It hath 4 short Stamina situated in the Tube, 2 of which are a little longer than the other, terminated by single Summits, and 4 Germen supporting a short Style crowned by an obtuse Stigma. The Germen afterwards become 4 Seeds wrapped up in a fringed Cover.

The Title of this Genus was given to this Plant by the late Dr. Housloun who discovered it growing naturally at La Vera Cruz in New Spain, in Honour of Lord Petre, who was a great encourager of Botany, and was possessed of a noble Collection of exotick Plants.

We have but one Species of this Genus, viz.

PETREA frutescens foliis lanceolatis rigidis, flore racemoso pendulo. Shrubby Petrea with stiff Spear-shaped Leaves, and Flowers growing in long hanging Bunches.

This Plant was first discovered by the late Dr. Housloun growing naturally at La Vera Cruz in New Spain, in 1731, since which it was sent me from the Island Barbuda, where it also grows naturally. This rises with a woody Stalk to the Height of 15 or 16 Feet, which is covered with a light gray Bark, sending out several long Branches these have a whiter Bark than the Stem, and are garnished with Leaves at each Joint, which on the lower Part of the Branches are placed by Threes round the Branches, but higher up they stand by Pairs; they are about 5 Inches long, and 2 Inches and a Half broad in the Middle, drawing to a Point at each End; they are stiff, and their Surface rough; of a light green, having a strong dark Mid-rib, with several transverse Veins running from the Mid-rib to the Borders, which are entire. The Flowers are produced at the End of the Branches growing in loose Bunches, which are 9 or 10 Inches long, each Flower standing upon a slender Foot Stalk about an Inch long; the Empalement of the Flower is composed of 5 narrow obtuse Leaves about an Inch long, which are of a fine blue Colour, so are much more conspicuous than the Petals, which are white, and not more than half the Length of the Empalement. After the Flower is past, the 4 Germen in the Center become so many oblong Seeds wrapped up in a fringed Cover.

The Doctor found a Variety of this with blue Petals, of the same bright Colour with the Empalement, which made a fine Appearance, every Branch being terminated by a long String of these Flowers, so that he has ranked this among the first Class of beautiful American Trees.

So far as I have been able to discover from the dried Samples which the Doctor brought to England, it appears that there are male and female Flowers either on different Parts of the same Tree, or upon different Trees; for one Spike of Flowers seems to be entirely male, and the other Spikes are female, but the Doctor has not noticed this in his Manuscript.

This is propagated by Seeds which must be obtained

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from the Places where the Trees grow naturally, and these are very few good; for, from the Seeds which the Dr. sent to England, there were but two Plants raised, though the Seeds were distributed to several Persons; this is a Sort of Confirmation of the Spikes of Flowers being of different Sexes, and that the Seeds, gathered by the Doctor were taken either from Trees at some Distance from the male, or such Parts of the same Tree which were remote from the male Flowers. The Seeds must be sown in a good hot Bed; when the Plants come up, they should be each planted in a small Pot filled with light loamy Earth, and plunged into a hot Bed of Tanners Bark, and placed after in the Bark Bed in the Stove, where they should constantly remain, and be treated like other Plants of the same Country.

PETROSELINUM. See Apium.

PEUCEDANUM. *Tourn. Infl. R. H.* 318. *Tab.* 169. *Lin. Gen. Plant.* 302. Hogs-Fennel or Sulphur-wort.

The Characters are,

It hath an umbelliferous Flower. The principal Umbel is composed of several long narrow Umbels which spread open. The Cover of the large Umbel is composed of many linear reflexed Leaves. The Empalement of the Flower is small and indented in 5 Parts. The Petals of the great Umbel are uniform. Each Flower is composed of 5 oblong incurved Petals, which are equal and entire; they have each 5 Hair-like Stamina terminated by single Summits, with an oblong Germen situated under the Flower, supporting two small Styles crowned by obtuse Stigmas. The Germen turns to an oval Fruit channelled on each Side, splitting in two Parts, containing 2 Seeds convex on one Side, compressed on the other, with 3 raised Furrows, and a broad membranous Border indented at the Top.

The Species are,

1. PEUCEDANUM foliis tripartitis filiformibus linearibus umbellis circinatis. Hogs-Fennel with Leaves which are divided by Threes, and these are again divided into three linear Parts. This is the *Peucedanum Germanicum*. *C. B. P.* 149. German Hogs-Fennel.

2. PEUCEDANUM foliis tripartitis filiformibus longioribus, umbellis difformibus. Hogs-fennel with Leaves cut into three Parts which are longer and slender, and have irregular Umbels. This is the *Peucedanum majus Italicum*. *C. B. P.* 149. Greater Italian Hogs-fennel.

3. PEUCEDANUM foliis quinqueis tripartitis filiformibus brevioribus, umbellâ maximâ. Hogs-fennel with five Leaves divided by Threes very slender and short, and a very large Umbel. This is the *Peucedanum Gallicum rarioribus & brevioribus foliis*. *H. R. Par.* French Hogs-fennel with Leaves less close and shorter.

4. PEUCEDANUM foliis tripartitis capillaribus, caule ramosissimo patulo, umbellis difformibus. Hogs-fennel with very narrow Hair-like Leaves divided by Threes, a very branching spreading Stalk, and irregular Umbels.

The 1st Sort is said to grow naturally in England, but I have not been lucky enough to find it, though I have searched the Places where it is mentioned, but it grows in several Parts of Germany in marshy Meadows. This hath a perennial Root, which divides into many strong Fibres running deep in the Ground, from which arise the Foot Stalks of the Leaves which are channelled; these are naked at Bottom, but about 4 or 5 Inches from the Root branches into 3 smaller Foot Stalks, and these again

again divide into three, and each of these Divisions sustain 3 narrow Leaves, which when bruised emit a strong Scent like Sulphur. The Stalks rise near 2 Feet high; these are channelled; and divide into 2 or 3 Branches, each being terminated by a large regular Umbel of yellow Flowers composed of several small circular Umbels. These Flowers appear in June, and are succeeded by compressed Seeds, which are deeply furrowed, and ripen in Autumn.

The 2d Sort grows naturally on the Mountains and in the low Valleys by the Sides of Rivers in Italy. The Root of this is perennial, striking deep into the Ground; the Foot Stalks of the Leaves are large and furrowed, dividing into 3 small Branches, which are again divided into 3, and these end with 3 long narrow Lobes or small Leaves, much longer than those of the other Sort. The Stalks which sustain the Umbels rise near 3 Feet high, and divide toward the Top into several small Branches, each sustaining an Umbel composed of several smaller Rays or Umbels, which stand upon very long Foot Stalks, and spread out irregularly. The Flowers of this are yellow, and shaped like the former, but are much larger, as are also the Seeds but have the same Form. It flowers and perfects Seeds about the same Time.

The 3d Sort grows naturally in the Forest of Fontainebleau and many other Parts of France; it hath a strong perennial Root, from which come out Leaves which branch into 3 Divisions, and these divide again into three smaller; each of these smaller Divisions are garnished with 5 short narrow Leaves. The Stalks are strong, round, and not so deeply channelled as either of the former, sustaining a very large Umbel of yellow Flowers, shaped like the former Sorts; the Seeds are shorter, but of the same Shape, it flowers in June, and the Seeds ripen in September.

The 4th Sort grows naturally on St. Vincent's Rock near Bristol; this is a biennial Plant which perishes soon after it has perfected Seeds. The Leaves of this Sort are short and very narrow, spreading near the Surface of the Ground; the Stalks rise near a Foot high, but are branched almost from the Bottom; these Branches are almost horizontal, and are garnished with a few narrow short Leaves, of a lucid green. Each Stalk is terminated by a small Umbel of Flowers of an herbaceous yellow Colour and small. These are succeeded by small channelled Seeds.

The 1st Sort stands in the List of medicinal Plants, but is at present rarely used; the Roots only are prescribed. It is accounted good to clear the Lungs of tough viscid Phlegm and thereby to help old Coughs and Shortness of Breath; it likewise opens Obstructions of the Liver and Spleen, and helps the Jaundice.

The other Sorts are preserved in Botanick Gardens for Variety, they are all propagated by Seeds sown in Autumn soon after they are ripe; for those sown in Spring seldom succeed, or if the Plants come up, it is rarely before the following Spring. When the Plants come up, they must be kept clean from Weeds, and the Autumn following they may be transplanted where they are to remain; they love a moist Soil and a shady Situation, but will not thrive under the Drip of Trees. The Roots of the three first Sorts will continue several Years, and every Year produce Flowers and Seeds.

The 4th Sort rarely ripens Seeds in a Garden, so I have been obliged to procure them from the Place where it grows naturally.

PHACA. Lin. Gen. Plant. 798. *Astragaloides*. Tourn. Inst. R. H. Bastard Milk-vetch, or *Astragaloides*.

The Characters are,

The Flower hath a tubulous Empalement of one Leaf, which is cut into 5 small Indentures at the Brim. The Flower is of the Butterfly Kind; it hath a large oval erect Standard, with two oblong Wings shorter than the Standard, which are obtuse, and a short compressed obtuse Keel. It hath ten Stamina, nine of which are joined in one Body, and the other stands separate, terminated by roundish rising Summits. In the Center is situated an oblong Germen, supporting an Awl-shaped Style, crowned by a single Stigma. The Germen becomes an oblong swelling Pod, whose upper Suture is depressed toward the under, having one Cell containing several Kidney-shaped Seeds.

The Species are,

1. PHACA caulescens pilosa, leguminibus tereti-cymbiformibus Lin. Sp. Plant. 755. Phaca with a hairy Stalk, and taper boat-shaped Pods. This is the *Astragaloides Lusitanica* Tourn. Inst. R. H. 399. Portugal Bastard Milk-vetch.

2. PHACA caulescens erecta glabra, leguminibus semi-ovatis. Lin. Sp. Plant. 755. Phaca with an upright smooth Stalk, and half oval Pods. *Astragaloides elatior erecta, vicie foliis, floribus luteis siliquis pendulis*. Amman. Ruth. 148. Taller upright Milk-vetch with a Vetch Leaf, yellow Flowers, and pendulous Pods.

The 1st Sort is a Native of Portugal and Spain, from whence the Seeds have been procured by some Persons who are curious in collecting rare Plants. This has been long preserved in some curious Gardens in England, but the other is more rare at present.

The Roots of the first Sort which grows naturally in Siberia, will abide many Years, and run very deep into the Ground; but the Branches decay every Autumn, and the Roots produce fresh Stalks every Spring, which will rise near four Feet high, and grow ligneous. The Flowers are produced in short Spikes from the Wings of the Leaves, but unless the Season proves very warm, they rarely flower in England, for which Reason the Plants are not much esteemed; for it is not once in seven Years that the Flowers arrive to Perfection, nor do the Plants ever produce Seeds in England; so that the Seeds must be procured from Abroad, by those who are desirous to have the Plants.

The 2d Sort has smooth Stalks, which do not rise so high as the former; the Flowers are smaller, the Pods are much shorter, and hang downwards.

Both these Sorts are propagated by Seeds, which should be sown where the Plants are to remain; for as they shoot their Roots very deep into the Earth, it is very difficult to transplant them with any Safety, especially after they have remained any considerable Time in the Seed Bed. The Plants should be left about six Feet asunder, that there may be Room to dig the Ground between them every Spring, which is all the Culture they require, except keeping them clean from Weeds.

PHALANGIUM. See Anthericum.

PHASELOIDES. See Glycine.

PHASEOLUS. Tourn. Inst. R. H. 412. Tab. 232. Lin. Gen. Plant. 777. Kidney-bean in French Haricot.

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The Characters are,

The Empalement of the Flower is of one Leaf, having two Lips; the upper Lip is indented at the Top, and the under one in 3 Parts. The Flower is of the Butterfly Kind; it hath a Heart-shaped, obtuse, inclined Standard, reflexed on the Sides, the Wings are oval, the Length of the Standard, and a narrow spiral Keel twisted contrary to the Sun. It hath 10 Stamina, 9 joined in one Body, and the other standing separate, which are spiral within the Empalement, terminated by single Summits, and an oblong compressed hairy Germen, supporting a slender, inflexed, spiral Style, crowned by an obtuse hairy Stigma. The Germen becomes a long Pod with a thick Shell, ending in an obtuse Point, inclosing oblong, compressed, Kidney-shaped Seeds.

It would be to little Purpose to enumerate all the Varieties of this Plant which have come to our Knowledge in this Place, since America annually furnishes us with so many new Sorts, that there is no knowing what Varieties there may be produced in England: Besides, as they are not likely to be much cultivated here, since some of the old Sorts are preferable to any of the new ones, for the Use of the Kitchen Garden; therefore I shall only first mention a few Sorts which are cultivated for their Flowers, or as Curiosities, and then mention those which are most esteemed for the Table.

1. PHASEOLUS caule volubili, floribus laxè spicatis, alis longitudine vexillo. Lin. Sp. P. 725. Kidney-bean with a twining Stalk, and Flowers growing in loose Spikes, whose Wings are as long as the Standard. This is the *Phaseolus flore purpureo, alis amplis longè protensis*. Hort. Elth. Kidney-bean with a purple Flower, having large Wings which are stretched out to a great Length.

2. PHASEOLUS caule volubili, vexillis corinâque spirâliter convolutis. Lin. Sp. Plant. 725. Kidney-bean with a twining Stalk, whose Standard and Keel are spirally twisted. This is the *Phaseolus Indicus cochleato flore*. Triumph. Obs. 93. Indian Kidney-bean with a Snail-shaped Flower, commonly called *Garacalla* in Portugal.

3. PHASEOLUS caule volubili, vexillis revolutis patulis, leguminibus linearibus strictis. Lin. Sp. Plant. 724. Kidney-bean with a twining Stalk, a spreading Standard which is twisted backward, and narrow close Pods. This is the *Phaseolus flore odorato, vexillo amplo patulo*. Hort. Elth. 313. Kidney bean with a sweet Flower, having a large spreading Standard.

4. PHASEOLUS caule volubili, pedunculis subcapitatis seminibus tetragono-cylindricis pulverulentis. Hort. Upsal. 214. Kidney-bean with a twining Stalk, Foot Stalks ending in Flowers growing in Heads, and four cornered cylindrical Dust-coloured Seeds. This is the *Phaseolus peragrinus, flore roseo, semine tomentoso*. Nissol. Aët. Par. 1730. Foreign Kidney-bean, with a Rose-coloured Flower and downy Seeds.

5. PHASEOLUS caule volubili, floribus racemosis geminis, bracteis calyce brevioribus, leguminibus pendulis. Lin. Sp. Plant. 724. Kidney-bean with a twining Stalk, branching Flowers growing by Pairs, Bractæ which are shorter than the Empalement, and hanging Pods. This is the *Phaseolus Indicus, flore coccineo sive puniceo*. Mor. Hist. 2. p. 69. Indian Kidney-bean, with a scarlet or purple Flower, commonly called the scarlet Bean.

6. PHASEOLUS caule volubili, floribus racemosis, siliquis brevibus pubescentibus. Kidney-bean with a twining

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Stalk, Flowers growing in long Bunches, and short hairy Pods: This is the *Phaseolus florum spica pyramidata, semine coccineo nigra macula notata*. Plum. Cat. 12. Kidney-bean with Flowers growing in a pyramidal Spike, and scarlet Seeds which are marked with black.

The 1st Sort is an annual Plant; the Seeds were brought from Carolina, where it grows naturally. The Stalks twine about any Support, like the common Kidney-bean; they are hairy, and rise 4 or 5 Feet high; the Leaves are shaped like those of the common Kidney-bean, but are narrower. The Flowers are produced in loose Spikes standing on long Foot-Stalks; they are large and of a purple Colour, turning to a blue before they fade. These appear in July, and if the Autumn proves warm, they will be succeeded by narrow long Pods, containing small oval Seeds which ripen in October.

The Seeds of this Sort should be sown on a warm Border about the latter End of April, and when the Plants begin to run up, they must be supported with Sticks, or fastened to a Hedge or Wall, to prevent their trailing on the Ground, and constantly kept clean from Weeds. If they are close to a Wall or Hedge exposed to a good Aspect, they will ripen Seeds in England, otherwise they frequently fail in bad Seasons.

The 2d Sort grows naturally in the Brazils from whence the Seeds were brought to Europe. This is a perennial Plant with twining Stalks, which rise to the Height of 12 or 14 Feet; the Leaves are shaped like those of the common Kidney-bean, but are smaller. The Flowers are produced in slender Spikes, they are of a purplish Colour, and have an agreeable Odour; these are succeeded by slender Pods which are compressed, containing several oval compressed Seeds. This is propagated by Seeds, which should be sown in a moderate hot Bed in the Spring; and when the Plants come up, they must be carefully transplanted into Pots filled with light fresh Earth, and plunged into a hot Bed, to facilitate their taking Root; after which they should be inured to bear the open Air by Degrees, into which they should be removed the End of June or Beginning of July, placing them in a sheltered Situation; and as they advance in Growth, and fill the Pots with their Roots, they should be removed into larger Pots, which must be filled up with light fresh Earth.

During the Summer Season, they must be frequently refreshed with Water; but in Winter they must be removed into the Green-house, and should have but little Water during that Season. These Plants when young, are tender, but after the first Winter, they will require only to be screened from Frost; but must have open free Air whenever the Weather will permit, otherwise the Leaves will grow mouldy, and decay the tender Shoots. This Plant produces Flowers in July and August, but seldom perfects Seeds in England. It is very common in Portugal, where the Inhabitants plant it to cover Arbours and Seats in Gardens, for which it is greatly esteemed by the Inhabitants of that Country, and for its beautiful sweet smelling Flowers, and in that Country it thrives very well in the open Air.

The 3d Sort grows naturally in America, and is preserved in some curious Gardens for Variety, but is a Plant of no great Beauty; this may be propagated by sowing the Seeds in Spring, upon a hot Bed, and when they come

come up, they must be planted in Pots, and treated as the former Sort. It produces its Flowers in *July*, and Seeds ripen in *September*.

The 4th Sort was brought from *America*, and is preserved in curious Gardens for the Sake of its long flowering. This is an abiding Plant, and should be managed as directed for the 2d Sort, but this requires a Stove to preserve it through the Winter in *England*.

The 5th Sort has been long cultivated in the *English* Gardens for the Beauty of its Scarlet Flowers; this hath twining Stalks, whis if properly supported, will rise to the Height of 12 or 14 Feet; the Leaves are smaller than those of the common Kidney-bean. The Flowers grow in large Spikes, and are much larger than those of the common Kidney-bean, and of a deep scarlet Colour; the Pods are large and rough, and the Seeds are purple marked with black. This Sort requires no other Treatment than the common Sort, but the Stalks should have tall Stakes put down by them to twine round, otherwise they will fall on the Ground, which will soon cause them to rot.

Although this Sort is chiefly cultivated for the Beauty of its Flowers at present, yet I would recommend it as the best Sort for the Table: and whoever will make Trial of this, I dare say must prefer it to all other Kinds yet known.

The 6th Sort grows naturally in the warmest Part of *America*, so will not thrive in *England* out of a Stove; and as the chief Beauty of it is in the Seeds, which are half scarlet and the other half black, so these may be procured from Abroad better than raised here.

I shall now mention those Sorts of Kidney-beans which are cultivated in the *English* Gardens to supply the Table, which are few in Comparison of the Number already known; though these are not many of them valuable, and are only cultivated because they require less Care or will come a little forwarder in the Season, for they are inferior in taste to the others; however, as there are some Persons who esteem them for their Qualities before-mentioned, so I shall put them down in the Order of their ripening for Use.

The 3 Sorts usually cultivated for early Crops, are the small white Dwarf, the Dwarf black, which is called the Negroe Bean, and the Liver Colour Bean. The Stalks of these are never very long, so may be planted much nearer together than the larger growing Kinds, and they require but little Support; so these are planted on hot Beds under Frames, or in Pots which are placed in Stoves, to come up early in the Spring, for which Purpose they are better adapted than any of the other; but they are not to be compared with some of the others for Goodness, but as they may be had at a Time when the others cannot not be so well obtained, so they are generally cultivated; and where there are not the Convenience of Stoves or Frames for raising them very early, they are planted in warm Borders near Hedges, Walls, or Pales, where they will be fit for Use a Fortnight earlier than the other Sorts.

The next to these are the *Battersea* and *Canterbury* Kidney-beans; these do not ramble far, and produce their Flowers near the Root, so bear plentifully for some Time: The *Battersea* Bean is the forwarder of the two, but the other will continue bearing much longer; the

are both better flavoured than either of the 3 former Sorts, but when they grow large are very stringy and tough.

There are two or three Sorts of Kidney-beans cultivated with erect Stalks, which want no support, as they do not put out any twining Stalks. These are much cultivated by the Gardeners for that Reason, as also for their producing a great Plenty of Pods; but they are inferior in Goodness to all the other, especially that Sort with black and white Seeds, whose Pods have a rank Flavour, and, when, boiled, become soft and mealy, so this should never be propagated by Persons of Taste.

The best Sorts for the Table are the scarlet Blossom Bean before-mentioned, and a white Bean of the same Size and Shape, which appears to be only a Variety of the scarlet, as it differs in no other Respect, but the Colour of the Flowers and Seeds, being equal in Size and Flavour. Next to these is the large *Dutch* Kidney-bean, which grows as tall as either of these, so must be supported by Stakes, otherwise their Stalks will trail on the Ground and spoil. The Sort with scarlet Flowers is preferable to this in Goodness, and is also hardier; and although it will not come so early as some of the Dwarf Kinds, yet as it will continue bearing till the Frost puts a Stop to it in Autumn, so it is much preferable to either; for the Pods of this Sort when old, are seldom stringy, and have a better Flavour than the young Pods of those Sorts, and will boil greener, and where this is sown in the same Situation and Soil as the *Battersea* Bean, it will not be a Fortnight later.

All the Sorts of Kidney-beans are propagated by Seeds, which are too tender to be sown in the open Air before the Middle of *April*; for if the Weather should be cold and wet after they are in the Ground, they will soon rot; or if Morning Frosts should happen after the Plants come up, they will be destroyed; therefore the best Way to have early Kidney-Beans, where there is no Convenience of Frames for raising them, is to sow the Seeds in Rows pretty close, upon a moderate hot Bed, the latter End of *March* or the Beginning of *April*. If the Heat of the Bed is sufficient to bring up the Plants it will be enough; this Bed should be arched over with Hoops, that it may be covered with Mats every Night, or in bad Weather. In this Bed the Plants may stand till the have put out their trifoliate Leaves, then they should be carefully taken up, and transplanted in warm Borders near Hedges, Pales, or Walls. If the Season proves dry at the Time of removing them, the Plants should be gently watered to forward their taking new Root, and afterward they must be managed in the same Way as those which are sown in the full Ground. These transplanted Beans will not grow so strong as those which are not removed, nor will they continue so long in bearing, but they will come at least a Fortnight earlier than those which are sown in the full Ground.

The first Crop intended for the full Ground, should be put in about the Middle of *April*; but these should have a warm Situation and a dry Soil, otherwise the Seeds will rot in the Ground; or if the Weather should prove so favourable as to bring up the Plants, yet there will be Danger of their being killed by Morning Frosts, which frequently happen the Beginning of *May*.

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The second Crop, which should be one of the three large Sorts last mentioned, should be sown about the Middle of May. These will come into bearing before the early Kinds are over, and if they are of the scarlet Sort, will continue fruitful till the Frost destroys the Plants in Autumn, and these will be good as long as they last. The Manner of planting them is, to draw shallow Furrows with a Hoe, at about two Feet and a Half Distance from each other, into which you should drop the Seeds about two Inches asunder; then with the Head of a Rake draw the Earth over them, so as to cover them about an Inch deep.

If the Season be favourable, the Plants will begin to appear in about a Week after sowing, and soon after will raise their Heads upright; therefore, when the Stems are advanced above Ground, you should gently draw a little Earth up to them, observing to do it when the Ground is dry, which will preserve them from being injured by sharp Winds; but be careful not to draw any of the Earth over their Seed Leaves, which would rot them, or at least greatly retard their Growth. After this, they will require no farther Care but to keep them clear from Weeds until they produce Fruit, when they should be carefully gathered two or three Times a Week; for if they are permitted to remain upon the Plants a little too long, the Beans will be too large for eating, and the Plants would be greatly weakened thereby.

The large Sorts of Kidney-bean must be planted at a greater Distance; for as these grow very tall, so if the Rows are too near, the Sun and Air will be excluded from the middle Rows, therefore these should not be less than 4 Feet Distance Row from Row; and when the Plants are about 4 Inches high, the Poles should be thrust into the Ground by the Side of the Plants, to which they will fasten themselves, and climb to the Height of 8 or 10 Feet, and bear Plenty of Fruit from the Ground upward. The Dutch and French preserve great Quantities of the large Dutch Beans for Winter Use, which they stew and make good with Gravy, and other Sauces. Some Persons raise these in hot Beds, to have them early. The only Care to be taken of these Plants, when thus raised is to allow them Room, and give them as much Air as can be conveniently, when the Weather is mild, also to let them have but a moderate Heat; for if the Bed be over hot, they will either burn, or be drawn up so weak as never to come to good.

The manner of making the hot Bed being the same as for Cucumbers, &c. need not be repeated; but only observe, when the Dung is equally levelled, to lay the Earth about 4 or 5 Inches thick, and let the great Steam of the Bed pass off before you sow the Seeds. The Time for doing this must be proportioned to the Season when you would have the Beans for the Table; but the surest Time for a Crop, is about a Week in February.

The Manner of saving the Seeds of these Plants is to let a few Rows remain ungathered in the Height of the Season; for if you gather from the Plants for some Time, and afterwards leave the remaining for Seed, their Pods will not be near so long and handsome, nor will the Seed be so good. In Autumn, when you find they are ripe, in a dry Season pull up the Plants, and spread them abroad to dry; after which you may thresh out the Seed, and preserve it in a dry Place for Use.

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PHILADELPHUS. Lin. Gen. Plant. 540. Syringa. Tourn. Inst. Syringa, Pipe Tree, or Mock Orange.

The Characters are,

It hath a permanent Emplacement of one Leaf, cut into 5 acute Parts sitting upon the Germen. It hath 4 or 5 roundish plain Petals which spread open, and 20 Awl-shaped Stamina the Length of the Emplacement, terminated by erect Summits with 4 Furrows. The Germen is situated under the Flower, supporting a slender Style divided in 4 Parts, each being crowned by a single Stigma. The Germen afterward becomes an oval, acute-pointed Capsule having 4 Cells, which are filled with small oblong Seeds.

The Species are,

1. PHILADELPHUS foliis ovato-lanceolatis acutè dentatis. Philadelphus with oval Spear-shaped Leaves acutely indented. This is the Syringa alba sive Philadelphus Athenæi. C. B. P. White Syringa, or Mock Orange.

2. PHILADELPHUS foliis ovatis subdentatis, flore solitario pleno. Syringa or Mock Orange with oval Leaves which are somewhat indented, and double Flowers standing singly on the Sides of the Branches. This is the Syringa nana nunquam florens. Cat. Hort. Angl. Dwarf Syringa which never flowers.

3. PHILADELPHUS foliis integerrimis. Lin. Sp. Plant. 470. Philadelphus with entire Leaves. This is the Philadelphus flore albo majore inodoro. Cat. Hort. Carol. 1. p. 84. Syringa with a larger white Flower having no Scent.

The 1st Sort has been long cultivated in the English Gardens as a flowering Shrub, but the Place where it naturally grows is uncertain. This sends up a great Number of slender Stalks from the Root, which have a gray Bark; these send out several short Branches from their Side, which are garnished with oval Spear-shaped Leaves; those upon the young Shoots are 3 Inches and a Half long, and 2 broad in the Middle, lessening toward both Ends, and terminating in acute Points; they have several acute Indentures on their Edges, their Surface rough, and of a deep green on their upper Side, but pale on their under, and have the Taste of a fresh Cucumber; these stand opposite upon very short Foot Stalks. The Flowers come out from the Side and at the End of the Branches, in loose Bunches, each standing on a short distinct Foot Stalk; they have 4 oval Petals which spread open, with a great Number of Stamina within, surrounding the Style. The Flowers are white, and have a strong Scent, which at some Distance resembles that of Orange Flowers, but when near is too powerful for most Persons. These appear the latter End of May, and continue great Part of June, but are seldom succeeded by Seeds which ripen in this Country. This Shrub rises 7 or 8 Feet high.

There is a Variety of this with variegated Leaves, which some preserve in their Gardens; but the Stripes generally disappear when the Plants are in Health.

The 2d Sort is of humble Growth, seldom rising above 3 Feet high; the Leaves are shorter than those of the former, and approach near to an oval Form; they are but little indented on their Edges. The Flowers come out singly from the Side of the Branches, and have a double or treble Row of Petals, of the same Size and Form as the other, they have the same Scent, but this Sort flowers very rarely, so is not much esteemed.

Both these are extreme hardy, and will thrive in almost any Soil or Situation, but will grow taller in light good

good Ground, than in that which is stiff. They are usually propagated by Suckers, which are sent out from their Roots in great Plenty; these should be taken from the old Plants in Autumn, and planted in a Nursery to grow one or two Years till they have obtained Strength, and then they should be transplanted to the Place where they are to remain. They are commonly disposed in Wilderness Work, among other Shrubs of the same Growth, where they add to the Variety.

The 3d Sort grows naturally in *Carolina*, and is as yet very rare in *Europe*. This rises with a shrubby Stalk about 16 Feet high, sending out slender Branches from the Sides opposite; these are garnished with smooth Leaves shaped like those of the Pear Tree, which are entire, standing opposite on pretty long Foot Stalks. The Flowers are produced at the End of the Branches, they are large, each having 4 oval Petals which spread open; these have large Empalements, composed of four acute-pointed Leaves. The Petals are white, and within these stand a great Number of short Stamina, terminated by yellow Summits. The Flowers are succeeded by oval Capsules, filled with small Seeds.

This Shrub is very rare in *England*, for it will not rise from Seeds; I have sown the Seeds which were sent me by the late Dr. Dale from *Carolina*, two or three Times without any Success, and others have done the same, which occasions its present Scarcity in *England*; but when the Plants are procured from Abroad, they may be propagated by laying down their Branches. I had one of the Shrubs which was sent me by the Gentleman before-mentioned, which had thriven in the *Chelsea* Garden near two Years; and some of the Branches which were laid down had put out Roots, but they were all destroyed by Cold in the Winter 1740.

PHILLYREA. Tourn. Inst. Lin. Gen. Plant. 19. *Phillyrea*, or Mock Privet; in *French*, *Filaria*.

The Characters are,

The Flower has a small permanent Empalement of one Leaf, cut into 5 Parts at the Brim. It has one Petal with a very short Tube, cut into 5 Parts which turn backward, and 2 short Stamina standing opposite, terminated by single erect Summits. It has a roundish Germen supporting a slender Style the Length of the Stamina, crowned by a thick Stigma. The Germen afterward turns to a globular Berry with one Cell, inclosing one large roundish Seed.

The Species are,

1. *PHILLYREA foliis ovato-lanceolatis integerrimis*, *Phillyrea* with oval Spear-shaped entire Leaves. This is the *Phillyrea latifolia laevis*. C. B. Broad leaved smooth *Phillyrea*, commonly called true *Phillyrea*.

2. *PHILLYREA foliis ovatis subintegerrimis*. *Phillyrea* with oval Leaves which are almost entire. This is the *Phillyrea folio leviter serrato*. C. B. *Phillyrea* with a Leaf lightly sawed, called broad-leaved *Phillyrea*.

3. *PHILLYREA foliis cordato-ovatis serratis*. Hort. Cliff. 4. *Phillyrea* with oval Heart-shaped Leaves which are sawed. This is the *Phillyrea latifolia spinosa*. C. B. P. 476. Broad-leaved prickly *Phillyrea*.

4. *PHILLYREA foliis lanceolatis integerrimis*. Hort. Cliff. 4. *Phillyrea* with Spear-shaped entire Leaves. *Phillyrea folio ligustri*. C. B. P. Privet-leaved *Phillyrea*.

5. *PHILLYREA foliis lanceolato-ovatis integerrimis, floribus confertis axillaribus*. *Phillyrea* with Spear-shaped,

oval, entire Leaves, and Flowers growing in Cluster from the Sides of the Branches. This is the *Phillyrea olæ Ephesiaca folio*. Pluk. Alm. 295. Phyt. Tab. 310. fig. 3. Olive leaved *Phillyrea*.

6. *PHILLYREA foliis lineari-lanceolatis integerrimis, floribus confertis axillaribus*: *Phillyrea* with narrow Spear-shaped entire Leaves, and Flowers growing in Clusters from the Sides of the Branches. *Phillyrea angustifolia prima* C. B. P. 476 First narrow-leaved *Phillyrea*.

7. *PHILLYREA foliis linearibus*. *Phillyrea* with very narrow Leaves. This is the *Phillyrea angustifolia secunda* C. B. P. 476. Second narrow-leaved *Phillyrea*, commonly called Rosemary-leaved *Phillyrea*.

The 1st Sort here mentioned, is the most common in the *English* Gardens, where it is known by the Title of true *Phillyrea*; so called, to distinguish it from the *Alaternus*, which is called simply, *Phillyrea* by the Gardeners. This rises with a strong upright Stem, to the Height of 18 or 20 Feet, dividing into several Branches, covered with a smooth grayish Bark, and garnished with oval Spear-shaped Leaves placed opposite; these are entire, firm, and of a light green, about an Inch and a Half long, and an Inch broad, standing upon short Foot Stalks. The Flowers come out from the Wings of the Stalk on each Side, they are of an herbaceous white Colour, and grow in small Clusters. These appear in March, but as they are small make no great Appearance; they are succeeded by globular Berries with one Cell, inclosing a single Seed of the same Form.

The 2d Sort rises to an equal Height with the first, but the Branches are more diffused, and have a darker Bark; the Leaves are oval, and of a darker green; they are more than 2 Inches long, and almost an Inch and a Half broad, a little sawed on their Edges; they are placed opposite, and have short Foot Stalks. The Flowers come out from the Wings of the Branches, growing in long Bunches; they are of an herbaceous white Colour, appear about the same Time as the former, and are succeeded by Berries of the same Form.

The 3d Sort rises with an upright Stem as high as the two former, sending out several strong Branches which grow erect, covered with a gray Bark, and garnished with oval Heart-shaped Leaves, about an Inch and a Half long, and one Inch broad; they are firm, of a lucid green, and are sawed on their Edges, each Serrature ending in a Spine. The Flowers and Seeds of this are like those of the two former Sorts.

The 4th Sort is of humbler Growth than either of the former, seldom rising more than 10 Feet high; the Branches are weaker, and spread wider than those and are covered with a light brown Bark; they are garnished with stiff Spear-shaped Leaves almost 2 Inches long, and half an Inch broad in the Middle, drawing to a Point at both Ends; they are of a light green, and sit close to the Branches opposite. The flowers are produced in small Clusters at the Wings of the Branches on each Side; they are small, and whiter than those of the former, appearing about the same Time, and are succeeded by small Berries which ripen in Autumn.

The 5th Sort rises about the same Height as the 4th the Branches are stronger and spread out wider; the Bark is of a lighter Colour; the Leaves are stiff, smooth, and entire, standing opposite on very short Foot Stalks;

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Stalks; they are of a lucid green, and terminate in a Point. The Flowers come out in Clusters upon pretty long Foot Stalks, at the Wings of the young Branches; they are small, white, and appear at the same Time with the other Sorts, and have round Berries succeeding them, which ripen in Autumn.

The 6th Sort rises with a woody Stalk 10 or 12 Feet high, sending out Branches by Pairs, which are covered with a brown Bark spotted with white; they are garnished with smooth, stiff, narrow, Spear-shaped Leaves, which are entire, sitting close to the Branches opposite; they are about an Inch and a Half long, and half an Inch broad in the Middle, drawing to a Point at both Ends, of a light green, and point upward. The Flowers come out in large Clusters at each Joint of the Branches, to which they sit close like the whorled Flowers, almost surrounding the Stalk; these are small, white, and appear at the same Time as the former, and are succeeded by small Berries which ripen in Autumn.

The 7th Sort is of humbler Growth than either of the former, seldom rising more than 5 or 6 Feet high, sending out slender Branches the whole Length, which come out opposite, and are sparsely disposed; the Leaves are of a dark green, stiff, and entire; they are about an Inch long, and not more than one Eighth of an Inch broad, sitting close to the Branches opposite. The Flowers are small, white, and grow in Clusters from the Side of the Branches. The Berries of this Sort are very small, and rarely ripen in *England*.

These Plants all grow naturally in the South of *France*, *Spain*, and *Italy*, but are hardy enough to thrive in the open Air in *England*, and are never injured except the Winters are very severe, which sometimes causes their Leaves to fall, and kills a few of the weaker Branches, but these are repaired by new Shoots the following Summer; so that there are but few of the ever-green Trees which are hardier than these, or that deserve more to be cultivated for Pleasure.

Formerly these were either planted against Walls, to which they were trained to cover them, or, if they were placed as Standards, their Branches were sheared either into Balls or Pyramids, like most of the ever-green Trees, so that when the former old Taste of laying out Gardens was exploded, the Ever-greens were generally banished, and for some Years there were but few Sorts cultivated, whereby several valuable Kinds of ever-green Trees were entirely lost in *England*, and have been with Difficulty retrieved since; for in the Manner which the ever-green Trees and Shrubs are now disposed in Gardens, they have a very fine Effect, especially during the Winter Season, when the other Trees are destitute of Leaves.

There are some other Sorts mentioned to grow naturally in *Spain* and *Italy*, but those here mentioned are all that I have seen growing in the *English* Gardens; several of these have been supposed only accidental Varieties which have been produced from Seeds; but I am more inclined to believe they are specifically different, for I have raised most of these from Seeds sent me from *Italy*, where the Sorts were carefully gathered distinct, and have never yet found them vary from the Kinds the Seeds were taken, so that I imagine those Seeds, from

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which 2 or 3 Kinds have been raised, were gathered from different Plants without Care.

The 3 first Sorts are very proper to intermix with other ever-green Trees of the same Growth to form Clumps in Parks, or to plant round the Borders of Woods, which are filled with deciduous Trees, where in the Summer Time the dark Shade of these Ever-greens will make a fine Contrast with the brighter green Leaves of the deciduous Trees, and in Winter, when the latter are destitute of Leaves, they will have a fine Effect; and these will be a fine Harbour for Birds. These may be trained up to Stems, so as to be out of the Reach of Cattle, therefore may be planted in open Places, where if they are fenced against Cattle till they are grown up, they may be afterwards exposed.

The other Sorts, which are of humbler Growth, must be confined to Gardens or other Inclosures, where they may be secured from Cattle, Hares, Rabbits, &c. otherwise they will be soon destroyed.

These Plants are propagated either from Seeds or Layers, but the latter, being the most expeditious Method in *England*, is chiefly preferred. The best Time to lay them down is in Autumn, when you should dig the Ground round the Stems of the Plants intended to be layed, making it very loose; then making Choice of a smooth Part of the Shoot, you should make a Slit upward (as practised in laying Carnations,) and then bend the Branch gently down to the Ground, making a hollow Place with your Hand to receive it; and having placed the Part which was slit into the Ground, so as that the Slit may be open, you should fasten it down with a forked Stick, that it may remain steady, covering that Part of the Branch with Earth about 3 Inches thick, observing to keep the upper Part erect. You must keep them clear from Weeds the Spring and Summer following, which, if suffered to grow up amongst them, will prevent their taking Root.

The Autumn following most of these Plants will be rooted, at which Time they may be taken off, and carefully planted in a Nursery, where they may be trained up 3 or 4 Years in the Manner you intend them to grow, during which Time you should dig the Ground between the Rows, and cut about the Roots of the Plants every Year, which will cause them to strike out strong Fibres, so as to support a good Ball of Earth when they are removed; you should also support their Stems with Stakes to make them Strait, otherwise they are very apt to grow crooked and unsightly.

When the Plants have been thus managed 3 or 4 Years, you may transplant them into the Places where they are to remain. The best Time for this Work is the latter End of *September*, or the Beginning of *October*; but in removing them, you should dig round their Roots, and cut off all downright or strong Roots, which have shot out to a great Distance, that you may the better preserve a Ball of Earth to each Plant, otherwise they are subject to miscarry; and when you have placed them in their new Quarters; you should lay some Muleh upon the Surface of the Ground to prevent its drying. You should also support the Plants with Stakes, until they have taken fast hold of the Earth, to prevent their being turned out of the Ground, or displaced by the Winds, which will destroy the Fibres that were newly

newly put out, and greatly injure the Plants. These Trees delight in a middling Soil, neither too wet and stiff, nor too dry, though the latter is to be preferred to the former, provided it be fresh.

Those Sorts with small Leaves are commonly two Years before they take Root, when laid; therefore they should not be disturbed, for the raising them out of the Ground greatly retards their rooting.

If these Plants are propagated by Seeds, they should be sown in Autumn soon after they are ripe, for when they are kept out of the Ground till Spring, they do not grow the first Year. The Seeds will do best if they are sown in Pots or Boxes filled with light loamy Earth, and placed under a Garden Frame, where they may be screened from hard Frost, but always exposed to the open Air in mild Weather. If the Seeds are sown early in the Autumn, the Plants will appear in the Spring, but if they should not come up, the Pots should be plunged into the Ground in an East Border, where they may only have the Morning Sun, in which Situation they should remain the following Summer, during which Time they must be constantly kept clean from Weeds, and in the Autumn removed again under a Frame for Shelter in Winter, and the Spring following the Plants will certainly come up, if the Seeds were good. Toward the Middle of April, the Pots should be again plunged into the Ground on an East Border, to prevent the Air from drying the Earth through the Pots, which is generally the Case when the Pots stand upon the Ground, so that they must then be frequently watered, which should not be practised to these Plants, where it can be avoided. The Michaelmas following the Plants should be carefully taken out of the Pots, and planted in a Nursery Bed, covering the Surface with old Tan to keep out the Frost, and if the Winter prove severe, they should be covered with Mats; afterward they may be treated as the Layers.

PHILLYREA OF THE CAPE. See Maurocena.

PHLOMIS. Tourn. Inst. R. H. 177. Tab. 82. Lin. Gen. Plant. 642. The Sage Tree, or Jerusalem Sage.

The Characters are,

The Flower hath a permanent Empalement of one Leaf, having an oblong Tube with 5 Angles. It hath one Petal, and is of the Lip-Kind. The Tube is oblong; the upper Lip is oval, forked, and inflexed; the under is cut into 3 Segments, the middle one being large and obtuse. It hath 4 Stamina hid under the upper Lip, 2 being longer than the other, terminated by oblong Summits, and a Germen divided into 4 Parts, supporting a Style the Length of the Stamina, crowned by an acute bifid Stigma. The Germen become 4 oblong cornered Seeds sitting in the Empalement.

The Species are,

1. PHLOMIS fruticosa, *salviae folio latiore & rotundior.* Tourn. Inst. 177. Shrubby Jerusalem Sage with a broader and rounder Sage Leaf.

2. PHLOMIS fruticosa, *salviae folio longiore & angustior.* Tourn. Inst. 177. Shrubby Jerusalem Sage with a longer and narrower Sage Leaf.

3. PHLOMIS latifolia, *capitata, lutea, grandiflora.* Hort. Elth. 316. Broad-leaved Jerusalem Sage with large yellow Flowers growing in Heads.

4. PHLOMIS Narbonensis, *bermini folia, flore purpura-*

scente. Tourn. Inst. R. H. 178. Jerusalem Sage of Narbonne with a Clary Leaf, and a purplish Flower.

5. PHLOMIS *urticae folio glabro.* Amman. Ruth. 40. Jerusalem Sage with a smooth Nettle Leaf.

6. PHLOMIS *lychnitis.* Clus. Hist. 27. Narrow-leaved Jerusalem Sage.

7. PHLOMIS *fruticosa Lusitanica, flore purpurascens, foliis acutioribus.* Tourn. Inst. 178. Shrubby Portugal Phlomis, with a purplish Flower, and acute-pointed Leaves.

8. PHLOMIS *Samia herbacea, folio lunariae.* Tourn. Cor.

10. Herbaceous Samian Jerusalem Sage with a Moonwort Leaf.

9. PHLOMIS *orientalis lutea herbacea latifolia, verticillata.* Phil. Transf. Vol. 34. Yellow, herbaceous, eastern, Jerusalem Sage having a broad Leaf, and Flowers growing in Whorls.

10. PHLOMIS *angustifolia lutea, cymis flavescentibus.* Sberard. Phil. Transf. No 376. Yellow, narrow-leaved, Jerusalem Sage with yellowish Tops.

11. PHLOMIS *orientalis, foliis auriculatis incanis, flore luteo.* Nissol. Eastern Jerusalem Sage with hoary eared Leaves, and a yellow Flower.

12. PHLOMIS *Hispanica, fruticosa, candidissima, flore ferruginea.* Tourn. Inst. 171. Whitest, shrubby, Spanish, Jerusalem Sage with an Iron-coloured Flower.

13. PHLOMIS *fruticosa, flore purpureo, foliis rotundioribus.* Tourn. Inst. 178. Shrubby Jerusalem Sage with a purple Flower, and rounder Leaves.

14. PHLOMIS *orientalis foliis laciniatis.* Tourn. Cor. 10. Eastern Jerusalem Sage with jagged Leaves.

The 1st Sort grows naturally in Spain and Sicily; this hath a pretty thick shrubby Stalk, covered with a loose Bark, rising 4 or 5 Feet high, dividing into many irregular Branches, which are four-cornered and woolly when young, but afterward become ligneous. Their Joints are pretty far asunder; at each of these are placed 2 roundish Leaves opposite on short Foot Stalks; they are woolly on their under Side. The Flowers come out in thick Whorls round the Stalks; they are yellow, and have 2 Lips; the upper Lip is forked, bending over the under which is divided into 3 Parts; the middle is broad, and stretched out beyond the 2 small side Segments. The Flowers appear in June, July, and August, but are rarely succeeded by Seeds here.

The 2d Sort hath a shrubby Stalk like the first, but does not rise so high. The Branches are weaker; the Leaves are Spear-shaped and oval, being longer, narrower, and rounder at both Points; the Whorls of Flowers are smaller, but the Flowers are of the same Shape and Colour. It flowers about the same Time.

These two Sorts have been long propagated in the English Gardens by the Title of Sage Tree, or Jerusalem Sage. The Plants were formerly kept in Pots, and housed in Winter with other exoticks, but of late they have been planted in the open Air, where they are seldom injured by Cold, unless in very severe Winters; they are intermixed with other Shrubs of the same Growth in Quarters of Wilderness Work, where they add to the Variety; for as they retain their hoary woolly Leaves all the Year, they make a good Appearance in Winter, and their yellow Flowers which continue great Part of Summer, being intermixed with their hoary Leaves, have a good Effect.

These:

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These Plants should have a dry Soil and a warm sheltered Situation or they will not live in the open Air. They may be planted among *Cistus* of all the different Kinds, the shrubby Moon-Trefoil, ever-green *Cistus*, Wormwood Tree, and other exotick Shrubs of the same Countries, which require a warm Situation and a dry Soil, being too tender for open Plantations which are exposed to strong cold Winds; and as they are not of very long Duration, they are better when separated from Trees and Shrubs, which continue many Years; for these rarely live above 12 or 14 Years in dry Ground, and not more than half so long in cold moist Land, or where they are not well sheltered.

They are propagated by Slips or Cuttings, which if planted in a Bed of light Earth in April, just before the Plants begin to shoot, and covered with Mats to screen them from the Sun every Day, as also to observe when the Ground is dry to give them Water gently, they will get good Roots in about two Months or ten Weeks, when they may be carefully taken up, and transplanted into a Nursery, where they may remain one Year, and then be transplanted to the Places where they are designed to stand, for these Plants will not bear transplanting at a greater Age.

The 3d Sort hath a shrubby Stalk like the former but much lower, seldom rising more than 2 Feet and a Half high, sending out Branches on every Side which are garnished with broader hoary Leaves than either of the former; these are of an oblong oval Form, and have pretty long Foot Stalks; they are whiter than those of the former. The Flowers grow in large Whorls or Heads, which generally terminate the Branches; they are larger than those of the other Sorts, and the upper Lip is very hairy. These appear about the same Time as those of the other Sorts. The Plants are equally hardy, and may be propagated by Slips or Cuttings in the same Way as before directed.

The 4th Sort grows naturally in the South of France, and in Italy; this hath a perennial Root, and an annual Stalk which rises about 2 Feet high, and decays in Autumn. When the Roots are large, they send up a great Number of square Stalks, covered with a hairy Down, and garnished with oblong, oval, rough Leaves, placed opposite, sitting close to the Stalks. The Flowers grow in Whorls round the Stalks, having stinging bristly Covers; they are of a bright purple Colour, so make a pretty Appearance. They appear at the same Time with the former, but are rarely succeeded by Seeds in England.

This may be propagated by parting the Roots; the best Time for doing this is in Autumn, when the Stalks begin to decay, that they may Root before the Frost comes on, but they should not be parted oftener than every third Year, if they are expected to have many Flowers. This Sort is hardy, so may be planted in exposed Places, but not in moist Ground.

The 5th Sort grows naturally in Tartary; this hath a perennial Root. The Stalks are purple, have four Corners, and rise 5 Feet high; they are garnished with Heart-shaped Leaves placed opposite; they are 6 Inches long, and 3 broad at their Base, but terminate in acute Points, and are deeply crenated on their Edges. The Flowers grow in Whorls round the Stalks; their Co-

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vers are Awl-shaped, and are set with stinging Hairs; they are of a pale purple Colour, and are hairy. These appear in June and July, and are succeeded by Seeds which ripen in September. Soon after which the Stalks decay, but the Roots will abide many Years. It is propagated by Seeds, which should be sown upon an East Border in the Spring, and when the Plants come up, they must be kept clean from Weeds the following Summer; in Autumn they should be transplanted where they are to remain; and the following Summer they will produce Flowers and Seeds. This Sort is very hardy, so will thrive in almost any Soil or Situation.

The 6th Sort grows naturally in the South of France, in Spain, and Italy. The Root is perennial; the Stalk is annual. This sends out long, narrow, woolly Leaves from the Roots in Tufts, which are enveloped at their Base by a common Covering; they are soft to the Touch and lie upon the Ground. The Stalks are slender, and near 2 Feet long; their Joints are far asunder; at each of these stand 2 oval Leaves opposite, which embrace the Stalk with their Base. The Whorls of Flowers are also encompassed by these Leaves, and within them is situated a radiated bristly Involucrum, which covers the Flowers which are yellow, and shaped like the other Sorts. These appear in July, but are rarely succeeded by Seeds in England. The Stalks decay in Autumn, but the lower Leaves last all the Year. It may be propagated by Slips in Spring, the Plants require a dry Soil and a warm Situation.

The 7th Sort grows naturally in Portugal and Spain. This hath a shrubby Stalk which rises 4 or 5 Feet high, sending out slender Branches, which have 4 Angles covered with a white Bark, and are garnished with oval Spear-shaped Leaves about 4 Inches long, and an Inch and a Half broad at their Base; they are crenated on their Edges, and woolly on their under Side, standing upon very short Foot Stalks. The Flowers come out in Whorls at each Joint; they have bristly Involucrum, and are of a deep purple Colour. This flowers in June and July, but does not ripen Seeds in England. It may be propagated by Cuttings in the same Way as the three first Sorts, and the Plants require the same Treatment.

The 8th Sort was discovered by the late Dr. Tournefort in the Levant, where it grows naturally; this hath a perennial Root and an annual Stalk. The Leaves of this are Heart-shaped; those at the Root are 3 Inches long, and an Inch and a Half broad at their Base ending in acute Points; they are downy on their under Side, and have 5 strong Veins. The Stalks rise a Foot and a Half high, and are garnished at each Joint with 2 Leaves placed opposite, of the same Form as the lower, but smaller. The Flowers grow in Whorls round the Stalks; they are of a worn out purple Colour; their Involucrum are cut into Segments, and are closely shut. This never produces Seeds here, and the Roots increase very slowly, so that now it is very rare in Europe; for before the severe Winter in 1740, these Plants had lived abroad in warm Borders upward of 20 Years, so that there were none of the Plants kept in Pots, and that Year they were all destroyed.

The Seeds of the 9th Sort were sent from Smyrna by the late Consul Sherard to the Chelsea Garden, where the

the Plants were raised; this has a perennial Root and an annual Stalk. The lower Leaves are near 3 Inches long, and an Inch and a Half broad, standing upon long woolly Foot Stalks; they are rough on their upper Side, but woolly on their under; they are Heart-shaped and entire. The Stalks rise a Foot high, and are very downy; the Flowers grow in Whorls round the Stalks; they have very long tubulous Empalements covered with Down; they are very large, and of a bright yellow, so make a good Appearance. It flowers the latter End of *June*, and in *July*, but never ripens Seeds in *England*. This Sort had survived many Winters in the open Air in the *Chelsea* Garden, but in the Year 1740 they were all destroyed.

The Seeds of the 10th Sort were also sent from *Smyrna* by the same Gentleman, and several of the Plants were raised in the *Chelsea* Garden. This hath shrubby Stalks which rise about 3 Feet high, and are covered with a yellowish Down, sending out many slender irregular Branches garnished with narrow Spear-shaped Leaves, which are covered with a yellowish Down on their under Side. The Flowers are produced in Heads at the End of the Branches; their Involucrum is very downy; The Flowers are smaller than either of the first Sorts, and are of a dirty yellow Colour. This approaches near to the 2d Sort, but the Leaves are much smaller, the Branches slenderer, and are covered with a yellow Down toward the End of the Branches. The Whorls of Flowers are not near so large, and are generally produced at the End of the Branches.

This Sort may be propagated by Cuttings as the three first Sorts, and the Plants may be treated in the like Manner, with this Difference only, of planting them in a warmer Situation, for it will not bear so much Cold, though in a warm Border the Plants have lived several Years abroad in the *Chelsea* Garden.

The 11th Sort grows naturally in the *Archipelago*, and also in *Spain*, from both which Countries I have received the Seeds. This Plant hath an annual Stalk, but the Root is perennial, as are also the lower Leaves, which do not arise from the Shoot immediately, but stand in Clusters upon short trailing woolly Branches; they have very long downy Foot Stalks, and are placed without Order; they are Heart-shaped, and downy on both Sides, about 4 Inches long, and 2 broad toward their Base. The Stalks are slender, and rise a Foot high; these are garnished with oval Spear-shaped Leaves, which gradually decrease in Size to the Top, where they are not half an Inch long. These Stalks generally send out 2 side Branches opposite, near the Bottom, and from this Division to the Top are garnished with thin Whorls of yellow Flowers, which are not closely joined together, as in the other Species, but each Flower stand separate. Their Empalements are oval, very downy, and closely shut up. The Flowers appear in *June* and *July*, but there are seldom any Seeds produced in *England*. This Sort may be propagated by Slips as the sixth Sort, and the Plants treated the like Way.

The 12th Sort grows naturally in *Spain* and *Portugal*; this hath an under shrubby Stalk, which is a little ligneous, and rises about 2 Feet and a Half high, covered with a thick white Down on every Plant. There are many of the Stalks which arise from the same Root;

they are garnished with Heart-shaped Leaves about 2 Inches long, and one broad toward their Base, and from the lower Part of the Stalks, at each Joint, there are 2 short Shoots come out opposite, which have 4 or 6 small Leaves of the same Shape with the others, and are covered with a very white Down. The Flowers are produced in small Whorls toward the upper Part of the Stalk; they have downy Spear-shaped Involucrum; they are short, and of an Iron Colour. They appear in *June* and *July*, but the Plants produce no Seeds in *England*.

This Sort multiplies by its spreading Roots, so that they may be divided every other Year; the best Time for this is about the Middle of *September*, that the Offsets may get Root before the Frost comes on, but there should be some Mulch laid about their Roots to prevent the Frost from penetrating the Ground. It may also be propagated by Cuttings as the three first Sorts, during the Spring and Summer Months. The Plants require the same Treatment as the 10th Sort, for they are not so hardy as the three first Sorts; therefore if there is some Tanners Bark, or other Mulch laid on the Surface of the Ground about their Roots every Winter, it will be a Means of preserving the Roots, so that if a severe Winter should kill the Stalks, the Roots will put out new ones the Spring following.

The 13th Sort grows naturally in *Spain* and *Portugal*. This rises with several shrubby Stalks from 3 to 4 Feet high, which divide into several four-cornered Branches covered with a woolly Down, and garnished with Leaves, which on the lower Part of the Stalks are Heart-shaped, but upward they are of an oval Spear Shape, and woolly on their under Side; the stand opposite upon short Foot Stalks. The Flowers come out in Whorls round the Stalks; they have Awl-shaped Involucrum ending in acute Points, and covered with Down; they are of a bright purple Colour, and appear in *June*, but are not succeeded by Seeds in this Country. This Sort is propagated by Slips or Cuttings as the three first Sorts, and the Plants should be treated as hath been before directed for the 10 Sort.

The 14th Sort was discovered by *Dr. Tournefort* in the *Levant*, from whence he sent the Seeds to the Royal Garden at *Paris*, where they succeeded. This Sort hath a perennial Root, and an annual Stalk which decays in Autumn, but the lower Leaves continue all the Year; these are alternately winged, and the small Lobes are cut on their Edges. The Stalks rise a Foot and a Half high, garnished with Leaves of the same Shape with the lower, but are smaller. The Flowers come out in Whorls round the Stalks, like those of the other Sorts, whose Empalements are downy; they are of a worn out purple Colour, and appear in *June*, but the Seeds do not ripen here.

It is propagated by Offsets from the Root as the 8th Sort, but these are sent out sparingly also, and the Plants require the same Treatment as the 8th Sort. It is at present very rare in *England*, for the severe Frost in the Year 1740 destroyed all the Plants in *England*, many of which had survived all the Winters for 20 Years before in the open Air.

All the Species of this Genus are ornamental Plants, when properly disposed in Gardens, so deserve a Place there,

there, for there is generally a Succession of Flowers on them for two or three Months, and their hoary downy, Leaves, when intermixed with Plants whose Leaves are green make a pretty Contrast.

The Leaves of the two first Sorts have been greatly recommended by some Persons to be used as Tea for sore Throats.

PHLOX. Lin. Gen. Plant. 197. *Lychnidea*. Dill. Hort. Elth. 166. *Lychnidea* or Bastard *Lychnis*.

The Characters are,

The Flower has a cylindrical Empalement of one Leaf which is permanent, and hath 5 acute Indentures at the Top. It has one Funnel-shaped Petal with a cylindrical Tube narrow at the Base, where it is incurved, and plain at the Top, and is cut into 5 equal roundish Segments which spread open. It hath 5 short Stamina, situated within the Tube, 2 of which are longer than the Tube, terminated by Summits in the Chaps of the Flower. It hath a conical Germen, supporting a slender Style the Length of the Stamina, crowned by an acute trifid Stigma. The Germen afterward turns to an oval Capsule with 3 Cells sitting in the Empalement, each Cell containing a single Seed.

The Species are,

1. PHLOX foliis lineari-lanceolatis glabris acuminatis, caule erecto ramoso, corymbo terminali. *Pbiox* with smooth, narrow, Spear-shaped Leaves, ending in acute Points, and upright branching Stalks terminated by Flowers, which grow in a Corymbus. This is the *Lychnidea Virginiana*, *holstei ampliore folio, floribus umbellatis purpureis*. Rand. Phil. Transf. Vol. 34. *Virginia* Bastard *Lychnis* with a larger Stitch-wort Leaf, and purple Flowers growing in Umbels.

2. PHLOX foliis lanceolatis sessilibus glabris crassis, caule erecto, floribus verticillatis terminalibus. *Pbiox* with smooth, thick, Spear-shaped Leaves sitting close to the Stalks, and upright Stalks terminated by Flowers growing in Whorls. This is the *Lychnidea Caroliniana*, *floribus quasi umbellatim dispositis, foliis lucidis crassis acutis*. Martyn. Dec. 1. Bastard *Lychnis* of *Carolina* with Flowers disposed as it were in an Umbel, and thick, shining, acute Leaves.

3. PHLOX foliis cordato-lanceolatis levibus. Lin. Sp. Plant. 152. *Pbiox* with Heart Spear-shaped Leaves, which are smooth. This is the *Lychnoides Marylandica*, *foliis binis oppositis basi & auriculis caulem utrinque amplexantibus*. Raii Supp. 459. *Maryland* Bastard *Lychnis* with Leaves growing opposite, whose Base embraces the Stalks on both Sides.

4. PHLOX foliis lato-lanceolatis, inferioribus alternis; caule ramoso. Lin. Sp. Plant. 152. *Pbiox* with broad Spear-shaped Leaves which are placed alternately at Bottom, and a branching Stalk. This is the *Lychnidea Virginiana*, *alsines aquaticæ foliis, floribus in ramulis divaricatis*. Pluk. Mant. 121. Bastard *Lychnis* of *Virginia* with Water Chickweed Leaves, and Flower Branches diverging from each other.

5. PHLOX foliis lanceolatis margine scabris, corymbis compositis. Lin. Sp. Plant. 151. *Pbiox* with Spear-shaped Leaves having rough Borders, and Flowers disposed in compound Corymbuses. This is the *Lychnidea Virginiana*, *umbellata maxima, Lyfimacbiæ luteæ foliis amplioribus, binis exadverso positis*. Pluk. Mant. 121. Bastard

Lychnis of *Virginia* with the largest Umbel, and large yellow Loostrife Leaves placed opposite by Pairs.

6. PHLOX foliis lanceolatis villosis, caule erecto, corymbo terminali. Lin. Sp. Pl. *Pbiox* with hairy Spear-shaped Leaves, and an upright Stalk terminated by a Corymbus of Flowers. This is the *Lychnoides Marylandica*, *calycibus lanuginosis, foliis angustis acutis*. Raii Supp. Bastard *Lychnis* of *Maryland* with woolly Empalements to the Flowers, and narrow acute-pointed Leaves.

7. PHLOX foliis ovatis, floribus solitariis. Lin. Sp. Plant. 152. *Pbiox* with oval Leaves and solitary Flowers. This is the *Lychnidea fistulosa Marylandica*, *clinospodii vulgaris folio, flore amplo singulari*. Pluk. Mant. 122. *Fistulous* Bastard *Lychnis* of *Maryland*, with a Field Basil Leaf, and large Flowers growing singly.

The 1st Sort grows naturally in *Virginia*, and in some other Parts of *North America*, but has been several Years in the *English* Gardens. This hath a perennial Root, which sends up several Stalks, in Number proportionable to the Size of the Roots; these rise near a Foot and a Half high, and divide into 3 or 4 small Branches toward the Top, which are terminated by a Corymbus of Flowers. The Leaves on the lower Part of the Stalks are placed opposite, and are about 3 Inches long, and near half an Inch broad at their Base, ending in long acute Points; they are smooth, and set close to the Stalks; the Leaves on the upper Part of the Stalks are placed alternate. The Flowers grow on the Top of the Stalks in a Sort of Corymbus, or rather in Form of an Umbel, many of them arising from the same Point, standing on short Foot Stalks; their Empalements are tubulous, and have 10 Angles or Furrows, and are cut at the Top into 5 acute Segments; the Tube of the Flower is twice the Length of the Empalement, and is divided at the Top into 5 roundish Segments which spread open; these are of a light purple Colour, and appear in June, but unless the Season proves warm, they are not succeeded by Seeds in *England*.

The 2d Sort grows naturally in *Carolina*; this hath a perennial Root, from which arise several smooth Stalks near 2 Feet high, garnished with stiff shining Leaves placed opposite, sitting close to the Stalks; they are Spear-shaped, entire, and their Edges are reflexed; the upper Part of the Stalk has generally 2 slender Side Branches, and is terminated by a Head of Flowers, which grow in Whorls round the Stalks, but the Whorls are so nearly placed, as to appear one Corymbus at some Distance. The Empalement of the Flower is short, and deeply cut into 5 acute Segments; the Tube of the Flower is long, and at the Top is cut into 5 roundish Segments, which spread open. These Flowers are of a deeper purple Colour than those of the former, and are a Fortnight later before they appear.

The 3d Sort grows naturally in *Maryland*; this hath a perennial Root, from which arise several upright Stalks of a purplish Colour, closely covered with white Spots; these grow about 3 Feet high, and are garnished with Heart Spear-shaped Leaves which are smooth, about 3 Inches long and one broad at their Base, ending in acute Points. Toward the upper Part of the Stalks, are sent out small Branches opposite, each being terminated by a small Bunch of Flowers; but the principal Stalk is terminated by a long loose Spike of Flowers, composed of small

small Bunches arising from the Wings of the Stalk at each Joint, each Cluster having one common Foot Stalk near an Inch long, but the simple Foot Stalks of the Flowers are short; the Flowers are of a bright purple Colour, and appear late in July; so that if the Season is temperate, or the Soil in which they grow moist, they will continue in Beauty great Part of *August*, but rarely ripen Seeds in *England*.

The 4th Sort grows naturally in *North America*; this has a perennial Root, from which arise several slender Stalks which are apt to incline to the Ground, if they are not supported; these divide into several small Branches, which spread from each other; the lower Part of the Stalks is garnished with broad Spear-shaped Leaves placed alternate, sitting close to the Stalks, and on the smaller Branches they are narrower, and placed opposite. The Flowers grow in loose Bunches at the End of the Branches, they have short Empalements, cut into 5 narrow, acute Segments; the Tube of the Flower is long and slender, the Segments at the Top are broad and Heart-shaped, inverted. The are of a light blue, and appear the latter End of *May* or Beginning of *June*, but are rarely succeeded by Seeds in *England*.

The 5th Sort grows naturally in *North America*; this hath a perennial Root and an annual Stalk, which is smooth, of a light green, and rises about 2 Feet high, sending out a few Side Branches; these are garnished with Spear-shaped Leaves placed opposite, near 3 Inches long and one broad at the Middle, drawing to a Point at each End, sitting close to the Stalks; they are of a dark green, and their Edges are little rough. The Flowers are disposed in a Corymbus at the Top of the Stalks, these are composed of many smaller Bunches of Flowers, which have each a distinct Foot Stalk, and support a great Number of Flowers, which stand upon short slender Foot Stalks; the Empalement of the Flower is short, and cut almost to the Bottom into 5 narrow acute Segments; the Tube of the Flower is long and slender, and is cut at the Top into 5 oval Segments which spread open. The Flowers are of a pale purple Colour, and appear late in *July*, but these are often succeeded by Seeds which ripen in Autumn.

The 6th Sort grows naturally in *Virginia*; this hath a perennial Root, from which arise a few single Stalks about a Foot high, garnished with narrow Spear-shaped Leaves, ending in acute Points; these sit close to the Stalks, and are a little hairy. The Flowers are produced in a loose Corymbus at the Top of the Stalk; their Empalements are cut into acute Segments almost to the Bottom; the Tube of the Flower is slender and pretty long, and is cut at the Top into 5 oval Segments, which spread open. The Flowers are of a light purple Colour, and appear the latter Part of *June*, but are seldom succeeded by Seeds in *England*.

The 7th Sort grows naturally in *Maryland*, and other Parts of *North America*. This hath a perennial Root, from which comes out 2 or 3 slender Stalks about 9 Inches high, garnished with oval, rough, hairy Leaves, an Inch and a Half long, and about 3 Quarters of an Inch broad in the Middle; they are placed opposite upon very short Foot Stalks. The Flowers come singly at the Top of the Stalk, they have very slender Tubes, but are cut into 5 roundish Segments, which

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spread open. They are of a light purple Colour, and appear in *July*, but are not succeeded by Seeds in *England*.

These Plants are hardy, so will thrive in the open Air in *England*; they delight in a moist rich Soil not too stiff, in which they will grow tall, and produce much larger Bunches of Flowers, than in dry Ground; for when the Soil is poor and dry, they frequently die in Summer, unless they are duly watered.

They are generally propagated by parting their Roots, because they do not often produce Seeds in *England*. The best Time for this is in Autumn, when their Stalks begin to decay. These Roots should not be divided into small Heads, if they are expected to flower well the following Summer; nor should they be parted oftener than every other Year, because when they are often removed and parted, it will greatly weaken the Roots, so that they will send out but few Stalks, and those will be so weak as not to rise their usual Height, and the Bunches of Flowers will be much smaller.

When the Roots are transplanted and parted, it will be a good Way to lay some old Tan, or other Mulch, upon the Surface of the Ground about their Roots, to prevent the Frost from penetrating it; for as they will have put out new Fibres before Winter, so the Frost when it is severe, often kills the Fibres, whereby the Plants suffer greatly, and are sometimes destroyed.

The 1st, 2d, and 5th Sorts, propagate pretty fast by their spreading Roots, but the others increase but slowly this Way, therefore the best Method to propagate them is by Cuttings; and if the three first Sorts are desired in Plenty, they may be easily obtained by this Method. The best Time to plant the Cuttings, is about the latter End of *April*, or the Beginning of *May*, when the Shoots from the Roots are about four Inches high; these should be cut off close to the Ground, and their Tops should be shortened; then they must be planted on a Border of light loamy Earth, and shaded from the Sun until they have taken Root; or if they are planted pretty close together, and covered with Bell or Hand Glasses, shading them every Day from the Sun, they will put out Roots in 5 or 6 Weeks; but when they begin to shoot, the Glasses should be gradually raised to admit the free Air to them, otherwise they will draw up weak and soon spoil: As soon as they are well rooted, the Glasses should be taken off, and the Plants inured to the open Air; then they should be soon after removed into a Bed of good Soil, planting them about 6 Inches Distance every Way, observing to shade them from the Sun, and water them duly till they have taken new Root; after which, if they are kept clean from Weeds, they will require no other Care till Autumn, when they should be transplanted into the Borders of the Flower Garden, where they are designed to remain.

If some of these Plants are put into Pots, and sheltered under a hot Bed Frame in Winter, they will flower strong the following Summer; and these may be placed in Court Yards, or other Places near the Habitation, when they are in Beauty, and being mixed with other Flowers will be very ornamental.

PHYLICA. *Lin. Gen. Plant.* 236. *Alaternoides. Com. Hort. Amst.* 1. p. 1. Bastard Alaternus.

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The Characters are,

The Flowers are collected in a Disk, sitting in a common Receptacle, each having a permanent Empalement, composed of 3 narrow oblong Leaves. They have one perforated Petal with an erect conical Tube, cut into 5 Parts at the Brim, and an acute Scale at each Division which join together within, and 5 small Stamina inserted under the Scales, terminated by single Summits. The Germen is situated at the Bottom of the Petal, supporting a single Style, crowned by an obtuse Stigma. The Germen becomes a roundish Capsule with 3 Lobes, having 3 Cells, each inclosing a single roundish Seed, gibbous on one Side, and angular on the other.

The Species are,

1. *PHYLICA foliis linearibus verticillatis*. Lin. Sp. Pl. *Phylica* with linear Leaves growing in Whorls. This is the *Alaternoides Africana*, *erica foliis*, *floribus albicantibus & muscosis*. Hort. Amst. African Bastard Alaternus, with Heath Leaves and white mossy Flowers.

2. *PHYLICA foliis lineari-subulatis, summis hirsutis*. Prod. Leyd. 199. *Phylica* with narrow Awl-shaped Leaves, which are hairy at the Top. This is the *Chamaelea foliis angustis subtus incanis, floribus capitatis muscosis*. Burm. Plant. Afr. 117. Tab 43. Spurge Olive, with narrow Leaves which are hoary on their under Side, and mossy Flowers collected in Heads.

3. *PHYLICA foliis ovatis sparsis*. Lin. Sp. Plant. 195. *Phylica* with oval Leaves growing scatteringly. This is the *Chamaelea folio subrotundo subtus incano, floribus in capitulum collectis*. Burm. Plant. Afr. 119. Tab. 44. Spurge Olive with roundish Leaves, which are hoary on their under Side, and Flowers collected in Heads.

The 1st Sort grows naturally at the Cape of Good Hope; from whence it was first brought to the Gardens in Holland, but it also grows naturally about Lisbon, where the Ground is covered with it like the Heaths in England. This is a low Bushy Plant, seldom rising more than 3 Feet high; the Stalks are shrubby and irregular, dividing into many spreading Branches, which are again divided into smaller. The young Branches are closely garnished with short narrow acute pointed Leaves placed in Whorls round the Stalks, to which they sit close; they are of a dark green, and continue all the Year. At the End of every Shoot the Flowers are produced in small Clusters fitting close to the Leaves; they are of a pure white, and begin to appear in Autumn, continuing in beauty all the Winter, and decay in the Spring, which renders the Plant more valuable. These Flowers are not succeeded by Seeds in England.

The 2d Sort grows naturally at the Cape of Good Hope, from whence it was brought to the Gardens in Holland. This hath an erect shrubby Stalk, which rises near 3 Feet high, covered with a purplish Bark, and here and there some White Down upon it; the Leaves are narrow, short, and acute-pointed, sitting close to the Branches in alternate Order, on every Side; they are thick, nervous, and of a dark green on their upper Side, but hoary on their under. The Flowers are collected in small Heads at the End of the Branches, they are white, woolly, and fringed on their Borders, cut into six acute Segments at the Top. These appear the Beginning of Winter, and continue long in Beauty, but are not succeeded by Seeds in England.

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The 3d Sort is a Native of the same Country as the former; this rises with a shrubby erect Stalk 5 or 6 Feet high; the Stalks when old, are covered with a rough purplish Bark, but the younger Branches have a woolly Down; these are garnished with thick oval Leaves about the Size of those of the Box Tree, they are veined, smooth, and of a lucid green on their upper Side, but are hoary on their under Side; they have short Foot Stalks, and stand without Order on the Branches. The Flowers are collected in small Heads at the End of the Branches, they are of an herbaceous Colour, so make no great Figure. These appear at the same Time with the former.

As these Plants do not produce Seeds in England, they are propagated by Cuttings, which, if properly managed, will take Root freely. There are two Seasons for planting these Cuttings, the first is the latter End of March before the Plants begin to shoot; if these are planted in Pots and plunged into a very moderate hot Bed, covering them close with Bell or Hand Glasses, observing to shade them from the Sun in the Middle of the Day, and to refresh them gently with Water, they will put out Roots in two Months; then they should be inured to the open Air, and after they have obtained Strength, they should be carefully taken out of these Pots, and each planted in a small Pot, filled with soft loamy Earth, and placed in a shady Situation until they have taken new Root, when they may be removed to a sheltered Situation, to remain till Autumn.

The other Season for planting these Cuttings, is about the Beginning of August; at this Time they may be planted in Pots, which may be either plunged into an old hot Bed, or the Ground, covering them close with Bell or Hand Glasses as before, and treating them in the same Way; these will put out Roots in about two Months, but it will then be too late in the Season to transplant them, so they must remain in the same Pots till Spring. If these are placed under a hot Bed Frame in Autumn, where they may be protected from the Frost, and exposed to the open Air in mild Weather, they will succeed better than when they are more tenderly treated.

These Plants are too tender to thrive in the open Air in England, so they must be kept in Pots and housed in Winter; for although the first Sort will live through the Winter in a warm sheltered Situation, when the Seasons prove favourable, yet when severe Frosts happen, they are always destroyed, but they require no artificial Heat to preserve them, if they are sheltered under a hot Bed Frame in Winter, when they are young, and after they are grown large, kept in a Green-house where they may enjoy the free Air in mild Weather, and treated in the same Way as other hardy exotick Plants from the same Country; in the Summer they must be placed abroad in a sheltered Situation, with which Management the Plants will thrive and continue several Years, and as they flower in the Winter, they make a good Appearance in the Green-house during that Season.

PHYLLANTHUS. Lin. Gen. Plant. 932. Sea-side Laurel.

The Characters are,

It hath male and female Flowers in the same Plant; the Empalements of the Flowers in both Sexes are permanent, Bell-shaped,

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Bell-shaped, and of one Leaf, cut into 6 Parts which spread open, and are coloured. The Flowers have no Petals according to some, or no Empalements according to others. The male Flowers have 3 short Stamina which join at their Base, but spread asunder at their Top, and are terminated by Twin Summits. The female Flowers have an angular Nectarium surrounding the Germen, which is roundish and three cornered, supporting 3 spreading Styles, crowned by obtuse Stigmas. The Germen becomes a roundish Capsule with 3 Furrows, having 3 Cells, each containing a single roundish Seed.

We know but one Species of this Genus, viz.

PHYLLANTHUS foliis lanceolatis serratis, crenis floriferis. Hort. Cliff. 439. *Phyllanthus* with Spear-shaped sawed Leaves, having Flowers growing on their Edges. This is the *Phyllanthus Americana* planta, flores & singulis foliorum crenis proferens. Hort. Amst. 1. p. 199. *American Phyllanthus*, with Flowers growing out of every Indenture of the Leaves.

This Plant grows naturally upon the Rocks near the Sea, in all the Islands of the *West-Indies*, where the Inhabitants title it Sea-side Laurel. This is seldom found growing on the Land, which occasions its Scarcity in *Europe*; for the Roots strike so deep into the Crevices of the Rocks, as to render it almost impracticable to transplant the Plants, and it is very difficult to propagate by Seeds; for unless they are sown soon after they are ripe, they will not grow, and the greatest Part of the Seed proves abortive, so that this Sort is very rare in *Europe*. There was formerly a Plant of this Sort in the Gardens at *Hampton-Court*, but this, with many other fine Plants, has been destroyed by the Ignorance of the Gardeners. I also saw a fine Plant of this Sort in the *Amsterdam* Garden.

This Tree grows about 15 or 16 Feet high, the Leaves come out without any Order, which are 5 or 6 Inches long, smooth, and thick; upon the Edges of the Leaves the Flowers are produced, but especially toward the upper Part, where they are placed very closely, so as almost to form a Sort of Border to the Leaves; which together with the shining green Colour of the Leaves, makes a very beautiful Appearance; the Leaves continue green all the Year, which renders the Plant more valuable.

It requires to be placed in a moderate Stove in the Winter, otherwise it will not live in *England*; but in Summer it may be placed in the open Air, in a warm sheltered Situation. With this Management the Plant was in great Vigour in the Physick Garden at *Amsterdam*.

The other Sorts, which in the former Edition of this Work were added to this, are now placed under *Andracbne*.

PHYLLIS. Lin. Gen. Plant. 286. *Bupleuroides*. Boerb. Ind. *Valerianella*. Dill. Hort. *Simpla Nobla*.

The Characters are,

The Empalement of the Flower is very small, composed of 2 Leaves sitting on the Germen. The Flower has 5 obtuse Spear-shaped Petals, which turn backward. It hath 5 short Hair-like Stamina, which are flaccid, terminated by oblong Summits. The Germen which is situated under the Flower, has no Style, but is crowned by 2 Awl-shaped reflexed hairy Stigmas. The Germen turns to an oblong

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angular Fruit, containing 2 parallel Seeds convex on their Outside, plain on the other, and broad at the Top.

We have but one Species of this Genus in the *English* Gardens, viz.

PHYLLIS stipulis dentatis. Prod. Leyd. 92. *Phyllis* with indented Stipulae. This is the *Bupleuroides quæ simpla nobla Canariensis*. Pluk. Boerb. Ind. alt. 1. p. 72. *Baltard Hare's Ear*, or *Simpla Nobla* of the *Canaries*.

This Plant grows naturally in the *Canary Islands*, from whence the Seeds were formerly brought to *England*. This rises with a soft shrubby Stalk about 2 or 3 Feet high, which is seldom thicker than a Man's Finger, of an herbaceous Colour, and full of Joints. These send out several small Side Branches toward the Top; these are garnished with Spear-shaped Leaves near 4 Inches long, and almost 2 broad in the Middle, drawing to a Point at each End; they are of a lucid green on their upper Side, but pale on their under, having a strong whitish Mid-rib, with several deep Veins running from it to the Sides; they are for the most Part placed by Threes round the Branches, to which they fit close. The Flowers are produced at the End of the Branches, in loose Panicles; they are small, and of an herbaceous Colour at their first Appearance, but before they fade, change to a brown or worn-out purple; they are cut into 5 Parts to their Base, where they are connected, and fall off without separating, so should be termed a Flower of one Petal. These Segments are reflexed backward so as to cover the Germen, which is situated under the Flower, and afterward becomes a short turbinated, obtuse, angular Fruit, which splits in 2 Parts when ripe, each containing one Seed, flat on the Inside, convex on the Outside and angular. This Plant flowers in *June*; the Seeds ripen in Autumn.

It is propagated by Seeds, which must be sown on a Bed of fresh light Earth toward the End of *March*, and the Plants will come up by the Beginning of *May*; when they are fit to transplant, they should be put into separate Pots, and placed in a shady Situation until they have taken Root; after which they should be placed in a sheltered Situation, where they may have the Morning Sun, and in Summer will require to be frequently watered. In Winter they must be sheltered from the Frost, but require to have as much free Air as possible in mild Weather; the second Year the Plants will flower, so if in the Spring some of the Plants are shaken out of the Pots and put into the full Ground, they will perfect their Seeds much better than those which remain in the Pots.

As these Plants seldom continue in Health above four or five Years, it will be proper to raise a Supply of young Plants to succeed them.

These Plants retain their Leaves all the Year, which being large and of a shining green, make a handsome Appearance in Winter, in which the Beauty of it consists, for the Flowers have none.

PHYSALIS. Lin. Gen. Plant. 223. *Alkekengi*. Tourn. Infl. R. H. 150. Tab. 64. Winter Cherry.

The Characters are,

The Flower hath a small swelling permanent Empalement of one Leaf, which is five cornered, and cut at the Top into 5 acute Points. The Flower hath one Wheel-shaped Petal with a short Tube, and a large Brim which is five

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cornered and plaited. It has 5 small Awl-shaped Stamina which join together, terminated by erect Summits, and a roundish Germen supporting a slender Style crowned by an obtuse Stigma. The Germen turns to an almost globular Berry with 2 Cells, inclosed in the large inflated Empalement, and is filled with compressed Kidney-shaped Seeds.

The Species are,

1. *PHYSALIS foliis geminis*. Lin. Sp. Plant. 183. *Physalis* with two Leaves at a Joint. This is the *Alkekengi officinarum*. Tourn. Inst. R. H. 151. The common or officinal Winter Cherry.

2. *PHYSALIS foliis cordatis integerimis obtusis scabris, corollis glabris*. Lin. Sp. Plant. 183. *Physalis* with rough, obtuse, entire, Heart-shaped Leaves, and smooth Petals. This is the *Alkekengi Bonariense repens, baccâ turbinatâ viscosa*. Creeping Winter Cherry of Buenos Ayres, with a viscus turbinated Berry.

3. *PHYSALIS radice perenni, caule procumbente, foliis ovatis acutè dentatis, petiolis longissimis*. *Physalis* with a perennial Root, a trailing Stalk, and oval Leaves which are acutely indented, and have very long Foot Stalks. This is the *Alkekengi Virginianum perenne majus, flore luteo amplo, fructu minimo*. Rand. Act. Phil. N° 399. Greater, perennial, Virginia Winter Cherry with a large yellow Flower, and a small Fruit.

4. *PHYSALIS caule herbaceo, foliis ovato-lanceolatis acutè dentatis*. Tab. 206. fig. 1. Winter Cherry with an herbaceous Stalk, and oval Spear-shaped Leaves which are acutely indented.

5. *PHYSALIS caule suffruticoso, foliis ovatis tomentosis integerrimis*. *Physalis* with a shrubby Stalk, and oval downy Leaves which are entire. This is the *Alkekengi Curassovicum, foliis origani incanis, flore viçetè sulphureo, fundo purpureo*. Boerb. Ind. alt. 2. p. 66. Winter Cherry of Curassao with hoary Origan Leaves and a rusty Sulphur-coloured Flower with a purple Bottom.

6. *PHYSALIS caule fruticoso, foliis ovatis tomentosis*. Lin. Vir. Cliff. 16. *Physalis* with a shrubby Stalk, and oval woolly Leaves. This is the *Solanum vesicarium Curassovicum, solani antiquorum simile, foliis origani subincanis*. Pluk. Phyt. Tab. 111. fig. 5. Bladder Nightshade of Curassao, having hoary Origan Leaves.

7. *PHYSALIS caule fruticoso, ramis rectis, floribus confertis*. Lin. Sp. Plant. 180. *Physalis* with a shrubby Stalk, erect Branches, and Flowers growing in Clusters. This is the *Alkekengi fructu parvo verticillato*. Tourn. Winter Cherry with a small Fruit growing in Whorls.

8. *PHYSALIS caule fruticoso, ramis flexuosis, floribus confertis*. Lin. Sp. Plant. 182. *Physalis* with a shrubby Stalk, flexible Branches, and Flowers growing in Clusters. This is the *Baccifera Indica, floribus ad foliorum exortus, fructu sulcato decapreno*. Raji Hist. 1632. Indian Berry-bearing Plant with Flowers coming out from the Foot Stalks of the Leaves, and a furrowed Fruit containing ten Seeds.

9. *PHYSALIS foliis ovato-lanceolatis integerrimis oppositis, caule fruticoso*. Tab. 206. fig. 2. *Physalis* with oval, Spear-shaped, entire Leaves placed opposite, and a shrubby Stalk. This is the *Alkekengi Americanum arborescens, fructu sphaerico rubro, vesicâ atro-purpureâ*. Houtt. Mss. Tree American Winter Cherry with a red spherical Fruit, and a deep purple-coloured Bladder.

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10. *PHYSALIS ramosissima, foliis villosis-viscosis penduculis nutantibus*. Lin. Sp. Plant. 183. The most branching *Physalis* with hairy viscous Leaves, and nodding Foot Stalks. *Alkekengi Virginianum fructu luteo*. Tourn. Inst. Virginia Winter Cherry with a yellow Fruit.

11. *PHYSALIS ramosissima, ramis angulatis glabris*. Lin. Sp. Plant. 183. The most branching *Physalis* with angular smooth Branches. This is the *Alkekengi Indicum majus*. Tourn. Inst. 151. Greater Indian Winter Cherry.

12. *PHYSALIS ramosissima, foliis ovatis acuminatis subdentatis petiolis longioribus*. Very branching *Physalis* with oval acute-pointed Leaves which are somewhat indented, and have longer Foot Stalks. This is the *Alkekengi Indicum minimum, fructu virescente*. Tourn. Inst. Least Indian Winter Cherry with a greenish Fruit.

13. *PHYSALIS ramosissima patula, ramis angulatis glabris, foliis lanceolatis pinnato-dentatis*. Most branching spreading *Physalis* with smooth angular Branches, and Spear-shaped Leaves indented like Wings.

14. *PHYSALIS ramosissima patula, ramis villosis, foliis ovatis acuminatis subdentatis*. The most branching spreading *Physalis* with woolly Branches, and oval acute-pointed Leaves somewhat indented. This is the *Alkekengi Barbadosense patulum, parvo flore, fructu amplo mucrone productiore*. Phil. Transf. N° 399. Spreading Winter Cherry of Barbadoes with a small Flower, and a large Fruit running out in an acute Point.

15. *PHYSALIS ramosissima, ramis villosis, foliis ovatis acuminatis serrato-dentatis*. The most branching *Physalis* with hairy Branches, and oval acute-pointed Leaves which are indented like a Saw. This is the *Alkekengi Americanum, annuum, ramosissimum, villosum, fructu rotundo ex luteo virescente*. Houtt. Mss. The most branching, annual, hairy, American Winter Cherry with a round, yellowish, green Fruit.

16. *PHYSALIS caule erecto ramoso, foliis ovatis serrato-dentatis, petiolis pedunculisque longissimis*. *Physalis* with an erect branching Stalk, oval, indented sawed Leaves, and the Foot Stalks of the Leaves and Flowers very long. *Alkekengi Americanum annuum, lamii folio, fructu cordato*. Houtt. Mss. Annual American Winter Cherry with a dead Nettle Leaf, and a Heart-shaped Fruit.

17. *PHYSALIS caule erecto ramoso, foliis ovato-lanceolatis viscosis, fructu maximo cordato*. *Physalis* with an erect branching Stalk, oval, Spear-shaped, viscous Leaves, and a large Heart-shaped Fruit. *Alkekengi Americanum, annuum, maximum viscosum*. Houtt. Mss. The largest, annual, viscous, American Winter Cherry.

18. *PHYSALIS caule erecto ramoso, ramis angulatis, foliis sinuatis, calycibus acutangulis*. *Physalis* with an erect branching Stalk, angular Branches, sinuated Leaves, and Empalements having acute Angles. This is the *Alkekengi amplo flore violaceo*. Feuille. Obs. 724. Tab. 16. Winter Cherry with a large Violet-coloured Flower.

The 1st Sort is the common Winter Cherry, which is used in Medicine; this grows naturally in Spain and Italy, but has been long cultivated in the English Gardens. The Roots are perennial, and creep in the Ground to a great Distance, if they are not confined; these shoot up many Stalks in the Spring, which rise about a Foot high or better, and are garnished with Leaves of various Shapes; some are angular and obtuse, others are oblong and acute-pointed; they are of a dark green, and

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and generally there are two Leaves coming out from the same Point on the same Side of the Stalk; they have long Foot Stalks. The Flowers are produced from the Wings of the Stalks, standing upon slender Foot Stalks; they have one white Petal which has a short Tube, and is cut at the Brim into five Angles spreading open. In the Center of the Tube is situated a roundish Germen, supporting a slender Style crowned by an obtuse Stigma; this is accompanied by five Stamina of the same Length terminated by oblong, erect, yellow Summits which join together. The Flowers appear in July, and are succeeded by round Berries about the Size of small Cherries, inclosed in an inflated Bladder which turns red in the Autumn, when the Top opens and discloses the red Berry, which is soft, pulpy, and filled with flat Kidney-shaped Seeds. Soon after the Fruit is ripe, the Stalks decay to the Root.

This Plant is easily propagated by Seeds or parting the Roots, the latter being the most expeditious Method is generally practised. These Roots may be transplanted and parted, any Time after the Stalks decay, till the Roots begin to shoot in the Spring; the love a shady Situation, and should be confined, otherwise they will ramble to a great Distance in one Year, and when the Stalks stand at a Distance, they make no Appearance. Their only Beauty is in the Autumn, when the Fruit is ripe, at which Time their red Bladders, opening and disclosing the Cherry-shaped Fruit, make a pretty Appearance.

The Leaves of this Plant are cooling, and of the Nature of common Nightshade; the Berries are a singular good Diuretick, and useful against the Gravel and Stone. There has been several Instances of their great Virtue in bringing away great Quantities of Gravel, when other Remedies have been tried without Success. The Berries boiled in Milk, and sweetened with Sugar, cure the Heat of Urine, making bloody Water, and Ulcers in the Kidneys and Bladder.

The 2d Sort grows naturally at *Buenos Ayres*; this hath a creeping Root, by which it multiplies very fast, sending up a great Number of smooth Stalks about a Foot high, which divide toward their Tops into small spreading Branches; these are garnished with Heart-shaped or oval Leaves about three Inches long, and two broad near their Base; they are entire and rough to the Touch, of a pale yellowish green, standing upon pretty long Foot Stalks placed alternately. The Flowers come out from the Wings of the Stalks toward the Top, and have long slender Foot Stalks; they are of a dirty yellow Colour with purple Bottoms. They appear in June and July, and are succeeded by viscous Berries about the Size of those of the common Sort, of an herbaceous yellow Colour, inclosed in a swelling Bladder of a light green Colour.

This Plant is easily propagated by parting the Roots either in Spring or Autumn, but is too tender to live abroad through the Winter in *England*, so they should be planted in Pots, and sheltered under a hot Bed Frame in Winter, where they may enjoy the free Air at all Times in mild Weather.

The Seeds of the 3d Sort were sent me from *Virginia*, where the Plant grows naturally; this hath a perennial Root and an annual Stalk, but these Roots do not creep

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in the Ground like the two former. The Stalks of this grow 2 Feet long, and spread on the Ground if they are not supported; these are garnished with oval Leaves 3 Inches long, and 2 Inches and a Half broad, standing alternately on very long Foot Stalks; they are of a pale green having several acute indentures on their Edges. The Flowers come out from the Wings of the Stalk on very short Foot Stalks; they are larger than those of the common Sort, and of a pale yellow Colour. These are succeeded by very small yellowish Berries which ripen in Autumn, when the Season proves warm, but in cool moist Summers they come to nothing.

This Sort is propagated by Seeds, which should be sown upon a warm Border about the latter End of *March*, and when the Plants come up, they should be thinned where they are too close, and kept clean from Weeds till Autumn, when they should be transplanted to the Places where they are to remain, which should be in a warm Situation, where they will live through the Winter in mild Seasons, but are killed by severe Frost if they are not screened.

The Seeds of the 4th Sort were sent me from *Philadelphia* by Dr. *Bensil*, who found the Plants growing there naturally. This hath a perennial Root composed of strong Fibres, from which arise 2 or 3 hairy Stalks about 9 or 10 Inches high, dividing into several Branches garnished with oval Spear-shaped Leaves of a pale green and hairy; about two Inches and a Half long, and an Inch and a Half broad, having several acute indentures on their Edges, and stand alternately upon short Foot Stalks. The Flowers come out from the Side of the Branches at the Base of the Foot Stalks of the Leaves; these have long slender Foot Stalks; the Flowers have very short Tubes, but are larger than most of the Species of this Genus: they are of a Sulphur Colour with a dark purple Bottom. These appear in July, and in warm Seasons are succeeded by oval yellowish Berries, which ripen in Autumn. This Sort may be propagated by Seeds as the third, and the Plants require the same Treatment.

The 5th Sort grows naturally at *Curassao* in the *West-Indies*. This hath a perennial creeping Root, from which arise several slender Stalks about a Foot high, which become somewhat ligneous, but do not last above two Years; the Leaves are entire, standing alternately upon short Foot Stalks; they are about 2 Inches long, and an Inch and a Half broad. The Flowers come out from the Wings of the Stalk toward the Top, standing upon short slender Foot Stalks; these are garnished with oval downy Leaves which are small, of a Sulphur Colour, and have dark purple Bottoms. These appear in July and August, but are seldom succeeded by Berries in *England*.

This is easily propagated by parting the Roots in Spring, but the Plants are too tender to bear the Winter in *England* without artificial Warmth, so the Pots should be placed in a moderate Warmth in Winter; during the Months of July, August, and September they may be placed in the open Air in a warm Situation.

The 6th Sort grows naturally at *Curassao*. This rises with a shrubby downy Stalk about 2 Feet high, dividing into several Branches covered with a thick soft Down,

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Down, and garnished with oval woolly Leaves, almost 2 Inches long, and one and a Half broad, which are entire, and stand alternately upon short Foot Stalks. The Flowers come out at the End of the Branches, at the Base of the Foot Stalks of the Leaves; they are small, of a yellow Colour, and sit close to the Branches. They appear in *July*, but are not succeeded by Berries in *England*.

This Sort may be propagated by Cuttings, which must be planted in small Pots filled with light loamy Earth, and plunged into a moderate hot Bed, observing to shade them from the Sun till they have put out Roots; after which they must be gradually hardened, and the Beginning of *July* they may be removed into the open Air, placing them in a sheltered Situation. When they have obtained Strength, they should be shaken out of the Pots and separated, planting each in a distinct Pot; then place them in the Shade till they have taken new Root, when they may be removed to their former Situation, where they may remain till the End of *September*, and then be removed into the Stove, where they should be placed in a moderate Temperature of Warmth during the Winter Season.

The 7th Sort grows naturally in *Crete*, *Sicily* and *Spain*. This rises with a shrubby Stalk near 3 Feet high, dividing into several Branches which grow erect, and are covered with a woolly Down; they are garnished with oval Spear-shaped Leaves almost 3 Inches long, and one and a Half broad in the Middle; they are downy, and stand upon short Foot Stalks. The Flowers come out in Clusters on the Side of the Branches; they are small, of an herbaceous white Colour sitting very close to the Branches, and are succeeded by small Berries almost as large as those of the first Sort, which when ripe are red. This flowers in *June* and *July*, and the Berries ripen in Autumn.

This Plant is propagated by Seeds, which may be sown on a Bed of light Earth the Beginning of *April*, and when the Plants are 2 or 3 Inches high, they should be carefully taken up, and each planted in a small Pot filled with Earth out of a Kitchen Garden, and placed in the Shade till they have taken new Root; then they may be removed to a sheltered Situation, where they may remain till the Beginning of *October*; at which Time they should be removed into the Green-house, for the Plants are too tender to live through the open Air in Winter, so they must be treated like other Green-house Plants, but should be sparingly watered in Winter. These Plants will continue several Years if they are not too tenderly treated.

The 8th Sort grows naturally at *Malabar* and also at the *Cape of Good Hope*. This rises 5 or 6 Feet, sending out long flexible Branches covered with a gray Bark, and garnished with oblong oval Leaves which are often placed opposite, and sometimes by Threes round the Branches to which they sit close. The Flowers are produced in Clusters at the Base of the Foot Stalks of the Leaves; they are small and of an herbaceous yellow Colour; these are succeeded by round purplish Berries having 10 Cells, each including one Seed. This Plant flowers in *July* and *August*, but unless the Season is warm, the Berries do not ripen in *England*.

This is propagated by Seeds, which should be sown

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upon a moderate hot Bed, and when the Plants have 4 Leaves, they should be transplanted on a fresh hot Bed, observing to shade them from the Sun till they have taken new Root; then they should have fresh Air admitted to them every Day in warm Weather to prevent their drawing up weak, and should be treated in the same Way as other exotick Plants. When these are grown 3 or 4 Inches high, they should be carefully taken up, and each planted in a small Pot filled with light loamy Earth, and placed in a Frame upon an old hot Bed, shading them from the Sun till they have taken new Root; then they should be gradually inured to bear the open Air, into which they should be removed in *July*, and placed in a warm Situation, where they may remain till the End of *September*; then they should be removed into Shelter, and the first Winter they should be placed in a moderate Stove, but when the Plants have obtained Strength, they will live through the Winter in a good Green-house.

The 9th Sort was discovered by Dr. *Houfoun* growing naturally at *Cambrachy*, from whence he sent the Seeds to *England*. This hath a shrubby Stalk which rises 10 or 12 Feet high, dividing toward the Top into several small Branches covered with a gray hairy Bark, and garnished with oval Spear-shaped Leaves; those on the lower Part are placed alternately, but toward the End of the Branches they are opposite. The lower Leaves are from 3 to 4 Inches long, and 2 broad in the Middle, drawing to a Point at both Ends; they are of a pale green, and are downy. The Flowers come out from the Wings of the Stalks toward the End of the Branches, sometimes one, and at other Times 2 are produced at the same Joint opposite; they stand upon short nodding Foot Stalks. The Flowers are small, of a pale dirty yellow Colour, having purple Bottoms; these are succeeded by small, spherical, red Berries included in an oval dark purple Bladder. It flowers in *June* and *July*, but unless the Season proves warm no Berries succeed them.

This may be propagated by Seeds and the Plants treated as the last mentioned, but they are not so hardy, therefore must be kept in a moderate Stove in Winter, but in the Middle of Summer they should be placed in the open Air in a sheltered Situation for about 3 Months, for if they are constantly kept in the Stove, they will draw up weak, so will not flower. It may also be propagated by Cuttings, which, if planted in Pots during the Spring and Summer Months, and plunged into a gentle Warmth, will take Root freely, and may be treated as before directed for the 6th Sort.

The 10th Sort is an annual Plant which grows naturally in *Virginia*. This branches out very wide close to the Ground, and the Branches frequently lie upon it; they are angular and full of Joints, dividing again into smaller Branches, and are garnished with hairy viscid Leaves, which are almost Heart-shaped, standing upon pretty long Foot Stalks; they are about 3 Inches long and almost 2 broad, having several acute Indentures on their Edges. The Flowers are produced on the Side of the Branches, on short, slender, nodding Foot Stalks; they are of an herbaceous yellow Colour with dark Bottoms; these are succeeded by large swelling

Bladders

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Bladders of a light green, inclosing Berries as large as common Cherries, which are yellowish when ripe. This Sort flowers in *June* and *July*, and the Berries ripen in Autumn.

If the Seeds of this Sort are permitted to scatter, the Plants will come up in the Spring, and require no other Care but to thin them, and keep them clean from Weeds; or if the Seeds are sown in the Spring on a common Border, the Plants will rise very well, and need no other Care.

The 11th Sort is also an annual Plant, which grows naturally in the Islands of the *West-Indies*; this rises with an upright branching Stalk from 2 to 3 Feet high. The Branches are smooth, angular, and are garnished with Spear-shaped Leaves ending in acute Points, and sharply indented on their Edges. The Flowers come out toward the End of the Branches upon short slender Foot Stalks; they are very small, of a dirty white Colour, and are succeeded by Berries the Size of common Cherries covered with an angular Bladder; they are of a yellowish Colour when ripe.

This Sort is propagated by Seeds which should be sown on a moderate hot Bed; and when the Plants come up and are a little advanced, they should be planted on a fresh hot Bed to bring them forward, and treated as the *Capsicum*. When they are grown strong, and are hardened to bear the open Air, they may be transplanted with Balls of Earth to their Roots into a warm Border, observing to water and shade them till they have taken Root; after which they will require no other Care but to keep them clean from Weeds.

The 12th Sort grows naturally in the *West-Indies*; this is an annual Plant with very branching Stalks which seldom rise above a Foot high. The Leaves are oval, of a deep green, and have long Foot Stalks; the Flowers are small, white, and stand upon short Foot Stalks; the Berries are small, and green when ripe.

The thirteenth Sort was discovered by the late Dr. *Houssoun* growing naturally at *La Vera Cruz*; this is a low annual Plant with a very branching spreading Stalk. The Leaves are Spear-shaped, downy, and have deep indentures on their Edges, which are opposite and regular like a winged Leaf; the Branches are smooth and angular; the Flowers small and white; the Fruit is small, and yellowish when ripe.

The Seeds of the 14th Sort were sent me from *Barbados*; this is a low annual Plant seldom rising more than 9 or 10 Inches high. The Branches are hairy, and spread out almost horizontally; the Leaves are oval, end in acute Points, and are a little indented; the Flowers are small, white, and are succeeded by large Fruit inclosed in a long acute-pointed Bladder.

The 15th Sort was also discovered at *La Vera Cruz*; this is an annual Plant with a very branching hairy Stalk. The Leaves are oval, acute-pointed, and indented like a Saw on their Edges; the Flowers are small, and of a pale yellow Colour; the Fruit is round, as large as a Cherry, and of a yellowish green when ripe.

The 16th Sort was discovered at *La Vera Cruz* by the same Gentleman; this is an annual Plant, with an upright branching Stalk near 2 Feet high, garnished with oval Leaves indented on their Edges like a Saw. They have long Foot Stalks, and change to a purplish

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Colour in the Autumn. The Flowers are small and white, standing on very long Foot Stalks, and are succeeded by large Berries almost as large, and of the Shape of Heart Cherries, of a yellowish green with some purple Stripes.

The 17th Sort was found in the same Country; this is an annual Plant, with a smooth, erect, branching Stalk near 3 Feet high, garnished with oval, Spear-shaped, viscous Leaves standing on long Foot Stalks. The Flowers are of a pale yellow, and small; these are succeeded by large Heart-shaped Fruit of a pale yellow when ripe. The six last mentioned Sorts are propagated by Seeds in the same Manner as the 11th, and the Plants require the same Treatment.

The 18th Sort grows naturally in *Peru*, from whence the younger *de Jussieu* sent the Seeds. This is an annual Plant rising with a strong, herbaceous, angular Stalk 4 or 5 Feet high, of a purplish Colour, dividing into several Branches which are angular, and spread out wide on every Side; these are garnished with oblong Leaves deeply sinuated on their Sides, and of a deep green. The Foot Stalks of the Flowers are short; the Empalement is large, Bell-shaped, and deeply cut into five Segments; the Flower is large, of the open Bell Shape, of a light blue Colour, and is succeeded by Berries about the Size of common Cherries, inclosed in a large swelling Bladder, having 5 sharp Angles. It flowers in *July*, and the Seeds ripen in Autumn; which if permitted to scatter, the Plants will come up the following Spring, or if the Seeds are sown on a Bed of rich Earth in Spring the Plants will rise easily, and may be afterward transplanted to the Borders of the Pleasure Garden, where they must be allowed Room; for if the Ground is good, the Plants will grow very large.

Father *Feuille*, who first discovered this Plant in *Peru*, and has given a Figure and Description of it, recommends it greatly for its Virtues, and says the *Indians* make great Use of the Berries to bring away Gravel, and to relieve Persons, who have a Stoppage of Urine, and gives the Manner of using them, which is, to bruise 4 or 5 of the Berries either in common Water, or white Wine, giving it the Patient to drink, and the Success is astonishing.

PHYTOLACCA. *Tourn. Inst. R. H.* 299. Tab. 154. *Lin. Gen. Plant.* 521. *American Night-shade.*

The Characters are,

The Flower hath no Petals according to some, or no Empalement according to others, for the Cover of the Parts of Generation being coloured is by the latter termed Petals; there are 5 of these which are roundish, concave, spreading open, and permanent. It has for the most Part 10 Stamina which spread open, and are the same Length as the Petals, terminated by roundish Summits, and 10 compressed orbicular Germens joined together on their Inside, but are divided on their Outside, upon which sit 10 very short Styles which are reflexed, and crowned by single Stigmas. The Germen turns to an orbicular depressed Berry, with 10 longitudinal deep Furrows, having 10 Cells, each containing a single smooth Seed.

The Species are,

1. PHYTOLACCA foliis integerrimis, radice perenni. *Phytolacca* with entire Leaves, and a perennial Root. This is the *Phytolacca Americana*, majori fructu. *Tourn. Inst.*

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Inf. 299. *American* Nightshade, with large Fruit, commonly called *Virginian* Poke, or *Porke* Physick.

2. *PHYTOLACCA foliis ovato-lanceolatis, floribus sessilibus.* *Phytolacca* with oval Spear-shaped Leaves, and Flowers sitting close to the Stalks. This is the *Phytolacca Mexicana, baccis sessilibus.* *Hort. Eltb. Mexican Phytolacca*, whose Berries grow close to the Stalk.

3. *PHYTOLACCA spicis florum longissimis, radice annua.* *Tab.* 207. *Phytolacca* with the longest Spikes of Flowers, and an annual Root.

The 1st Sort grows naturally in *Virginia*, also in *Spain* and *Portugal*; this hath a very thick fleshy Root, as large as a Man's Leg, divided into several thick fleshy Fibres, which run deep in the Ground. When the Roots are become large, they send out 3 or 4 Stalks, which are very herbaceous, as large as a good walking Stick, of a purple Colour, and rise to the Height of 6 or 7 Feet, dividing into many Branches at the Top; these are garnished with Leaves about 5 Inches long, and 2 Inches and a Half broad; they are rounded at their Base, but terminate in a Point; they are placed without Order, and have short Foot Stalks; they are of a deep green, and in Autumn change to a purplish Colour. From the Joints of the Branches, and at their Divisions come out the Foot Stalks of the Flowers which are about 5 Inches long; the lower Part is naked, but the upper Half sustains a Number of Flowers ranged on each Side like common Currants. Each Flower stands upon a Foot Stalk half an Inch long; the Flowers have 5 purplish Petals, within which stand the 10 Stamina and Styles. After the Flowers are faded, the Germen turns to a depressed Berry with 10 Furrows, having 10 Cells, filled with smooth Seeds. It flowers in *July* and *August*, and in warm Seasons the Berries ripen in Autumn.

It may be propagated by sowing the Seeds in Spring on a Bed of light Earth, and when the Plants come up, they should be transplanted into the Borders of large Gardens, allowing them Space to grow, for they must not be planted too near other Plants, lest they overbear and destroy them, as they grow to be very large, especially if the Soil be very good. When they have taken Root, they will require no farther Care, but only to clear them from Weeds, and in the Autumn they will produce their Flowers and Fruit; but when the Frost comes on, it will cut down the Stems of these Plants, which constantly decay in the Winter, but their Roots will abide in the Ground, and come up again the succeeding Spring.

The Roots of this Plant will continue many Years, if they are planted in a dry Soil, for Wet in Winter standing about the Roots will cause them to rot, and sometimes the Frost in very severe Winters will kill them, if the Surface of the Ground is not covered with Mulch, but in our ordinary Winters they are never injured.

Parkinson says that the Inhabitants of *North America* make Use of the Juice of the Root as a familiar Purge; two Spoonfuls of the Juice will work strongly. Of late there have been some Quacks, who pretend to cure Cancers with this Herb, but I have not met with one Instance of its having been serviceable in that Disorder. The Inhabitants of *North America* boil the young Shoots of this Plant, and eat it like Spinach. The Juice of the

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Berries stain Paper and Linen of a beautiful purple Colour, but it will not last long. If there could be a Method of fixing the Dye, it might be very useful.

The 2d Sort grows naturally in the *Spanish West-Indies*; the late Dr. *Houfston* found it in great Plenty at *La Vera Cruz*, where the Inhabitants constantly used it for their Table. This Plant is biennial, seldom continuing longer than 2 Years, and when it flowers and produces Plenty of Seeds the first Year, the Plants frequently die before the following Spring. This hath an herbaceous Stalk, about 2 Feet high, about the Size of a Man's Finger, dividing at the Top into 2 or 3 short Branches, and is garnished with oval Spear-shaped Leaves near 6 Inches long, and almost 3 broad, drawing to a Point at each End; they have a strong longitudinal Midrib, and several transverse Veins running from that to the Sides; they are of a deep green, and have Foot Stalks an Inch and a Half long, placed without Order on the Stalk. The Foot Stalks of the Flowers come out from the Side of the Branches opposite to the Leaves; they are 7 or 8 Inches long; the lower Part about 2 Inches in Length is naked; the remaining Part is garnished with white Flowers sitting close to the Stalks; these are succeeded by flat Berries having many deep Furrows divided into so many Cells, each containing one or two smooth Seeds. This flowers in *July* and *August*, and the Seeds ripen late in Autumn.

The 3d Sort grows naturally in *Malabar*, from whence I received the Seeds; this Plant is annual, always perishing soon after it has perfected Seeds, so that in this Particular it differs greatly from the first; this rises with an herbaceous Stalk from 2 to 3 Feet high, which has several longitudinal Furrows, and changes the latter Part of Summer to a purplish Colour. It divides at the Top into 3 or 4 Branches, garnished with Spear-shaped Leaves 6 or 7 Inches long, and almost 3 broad in the Middle, drawing to a Point at each End; they are of a deep green, and have short Foot Stalks; sometimes they stand alternately, at others they are placed opposite, and are frequently oblique to the Foot Stalk. The Foot Stalks of the Flowers come out from the Side of the Branches opposite to the Leaves; they are 9 or 10 Inches long, the lower Part being naked as in the other Sorts, but not so long; the other Part is garnished with larger Flowers than those of the other Sorts; they are white on their Inside, of an herbaceous Colour on their Edges, and purplish on their Outside, standing upon short Foot Stalks; these have not always the same Number of Stamina, some of them have but 8, and others 9, which are terminated by roundish Summits. These Flowers are succeeded by orbicular, compressed, soft Berries divided by deep Furrows on their Outside into 10 Cells, each containing one smooth shining black Seed; the Racemus of Flowers is very narrow at the Top, where it is commonly inclined. This flowers in *July* and *August*, and the Seeds ripen in Autumn.

The Berries of this Sort are very succulent, and their Juice stains Paper and Linen of a beautiful purple Colour but it is not permanent.

These two Sorts are not so hardy as the first, so their Seeds should be sown upon a moderate hot Bed in the Spring, and when the Plants are fit to remove, they should

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should be transplanted to another hot Bed to bring them forward, observing to shade them from the Sun till they have taken new Root; after which they should be treated as other tender exotick Plants, and the Beginning of July they may be transplanted out upon a warm Border, or into Pots filled with light rich Earth, and shaded from the Sun till they have taken new Root; after which they will require to be watered duly in dry Weather, and kept clean from Weeds. As these Plants perfect their Seeds every Autumn, they may be easily preserved.

PIERCEA. *Solanoides*. Tourn. *Art. Par.* 1706.

The Characters are,

The Flower has no Petals; the Empalement which incloses the Parts of Generation is composed of 4 oblong oval, coloured Leaves, by some called Petals. It hath 4 Stamina, which stand erect and close together, terminated by small Summits. In the Center is situated a large roundish Germen, supporting a short Style crowned by an obtuse Stigma. The Germen turns to a roundish Berry sitting upon the reflexed Empalement, having one Cell inclosing a rough round Seed.

I have taken the Freedom of inscribing this Genus of Plants to the Right Honourable Hugh Piercy, Earl of Northumberland, who is not only a great Encourager of Botanical Studies, but greatly skilled in the Science himself.

The Species are,

1. *PIERCEA foliis ovato-lanceolatis glabris*. *Piercea* with oval, Spear-shaped, smooth Leaves. This is the *Solanoides Americana*, *circææ foliis glabris*. Tourn. *Art. Par.* 1706. *American Solanoides* with smooth Enchanters Nightshade Leaves.

2. *PIERCEA foliis cordatis pubescentibus*. *Piercea* with Heart-shaped downy Leaves. This is the *Solanoides Americana* *circææ foliis consescentibus*. Tourn. *Art. Par.* 1706. *American Solanoides* with hoary Leaves like Enchanters Nightshade.

These Plants grow naturally in most of the Islands in the West-Indies, but the first is the most common there. This rises with a slender herbaceous Stalk 3 or 4 Feet high, and by Age becomes a little ligneous at the Bottom. It divides into many Branches which are herbaceous, and have Angles; these are garnished with oval, Spear-shaped Leaves near 4 Inches long, and 2 broad in the Middle; they are of a bright green, and have slender Foot Stalks an Inch and a Half broad. The Foot Stalks of the Flowers come out from the Side of the Branches, at the Base of the Foot Stalks of the Leaves; they are from 4 to 5 Inches long, sustaining a great Number of small white Flowers ranged along the upper Part on both Sides. These are succeeded by small red Berries full of a red Juice, inclosing one hard Seed of the same Form.

There is a Succession of Flowers upon this Plant most Part of the Year, which are succeeded by Berries ripening after each other, so that the Plants are seldom destitute of them, and although the Flowers make but a small Appearance, yet the long Bunches of bright red Berries, hanging on all the Branches great Part of the Year, have a fine Effect.

The 2d Sort grows taller than the first, and the Branches grow more erect; the Leaves are smaller,

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Heart-shaped, and covered with short hairy Down; the Spikes of Flowers are not so long nor the Flowers so closely placed together, but have longer Foot Stalks. This continues flowering and producing ripe Fruit as the other, most Part of the Year.

These Plants are propagated by Seeds, which should be sown soon after they are ripe, for if they are kept long out of the Ground, they seldom grow the same Year. They should be sown in Pots filled with light Earth, and plunged into a moderate hot Bed, and when the Plants come up, they should be kept clean from Weeds, and gently watered as the Earth becomes dry. When the Plants are 2 Inches high, they should be each planted in a small Halfpenny Pot filled with light Earth, and plunged into a moderate hot Bed, observing to shade them till they have taken new Root; after which they must be treated as other exotick Plants, by admitting fresh Air to them daily, according to the Warmth of the Season, and giving them Water as often as they require it. When the Plants have obtained Strength, they should be removed into the Stove, and placed on Shelves, and there they must constantly remain, for they are too tender to thrive in the open Air in England in the warmest Part of the Year.

The Juice of the Berries of this Plant will stain Paper and Linen of a bright red Colour, and I made many Experiments with it to colour Flowers, which have succeeded extremely well; these were made in the following Manner. I pressed out the Juice of Berries, and mixed it with common Water, putting it into a Phial, shaking it well together for some Time, till the Water was thoroughly tinged; then I cut off the Flowers which were just fully blown, and placed their Stalks into the Phial, and in one Night the Flowers have been finely variegated with red. The Flowers, which I made the Experiments on, were the Tuberoze, and the double white Narcissus.

PILOSELLA. See Hieracium.

PIMPINELLA. *Lin. Gen. Plant.* 328. *Tragoselinum* Tourn. *Inst.* Burnet Saxifrage; in French, *Bouage*.

The Characters are,

It hath an umbellated Flower; the principal Umbel is composed of many Rays or smaller Umbels, neither of these have any Involucrum, and the Empalements are scarce visible: the greater Umbel is uniform. The Flowers have 5 Heart-shaped inflexed Petals nearly equal, and 5 Stamina which are longer than the Petals, terminated by roundish Summits. The Germen is situated under the Flower, supporting 2 short Styles, crowned by obtuse Stigmas. The Germen becomes an oblong oval Fruit, divided in 2 Parts, containing 2 oblong Seeds, plain on the Inside and convex on the other, and furrowed.

The Species are,

1. *PIMPINELLA foliis pinnatis, foliolis cordatis serratis, summis simplicibus trifidis*. Burnet Saxifrage with winged Leaves, having Heart-shaped sawed Lobes, and single three-pointed Leaves at the Top. This is the *Tragoselinum majus*, *umbellâ candidâ*. Tourn. *Inst. R. H.* 309. Greater Burnet Saxifrage with a white Umbel.

2. *PIMPINELLA foliis pinnatis, foliolis radicalibus subrotundis, summis linearibus*. *Lin. Sp. Plant.* 263. Burnet Saxifrage with winged Leaves, whose Bottom Lobes are roundish, but those at the Top linear. This is the

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Tragofelinum alterum majus. Tourn. Inst. R. H. 309. Another greater Burnet Saxifrage.

3. *PIMPINELLA foliis pinnatis, foliolis radicalibus pinnatifidis, summis linearibus trifidis*. Burnet Saxifrage with winged Leaves, whose Lobes at the Bottom Leaves are Wing-pointed, and the upper ones linear and trifid. *Tragofelinum minus* Tourn. Lesser Burnet Saxifrage.

4. *PIMPINELLA foliis pinnatis birsutis, foliolis radicalibus cordatis inaequaliter serratis, summis linearibus quinquefidis*. Burnet Saxifrage with hairy winged Leaves, whose Lobes at the Bottom Leaves are Heart-shaped and unequally sawed, and the upper ones linear and five-pointed. This is the *Tragofelinum radice nigra Germanicum*. Jussieu. Hort. Chelf. Cat. 100. German Burnet Saxifrage with a black Root.

5. *PIMPINELLA foliis pinnatis lucidis, foliolis radicalibus lanceolatis, pinnato-serratis, summis linearibus pinnatifidis*. Burnet Saxifrage with shining winged Leaves, the Lobes of whose Bottom Leaves are Spear-shaped and sawed, and the upper ones linear and Wing-pointed. This is the *Tragofelinum Austriacum maximum, foliis profundissime incisiss*. Boert. Hort. Chelf. Largest Burnet Saxifrage of *Austria*, whose Leaves are deeply cut.

6. *PIMPINELLA foliis radicalibus pinnatis crenatis, summis cuneiformibus incisiss*. Lin. Sp. Plant. 164. Burnet Saxifrage whose lower Leaves are winged and indented on their Edges, and the upper ones Wedge-shaped and cut. This is the *Apium peregrinum foliis subrotundis*. C. B. P. 153 Foreign Parsley with roundish Leaves.

7. *PIMPINELLA foliis radicalibus trifidis incisiss*. Lin. Sp. Plant. 264. Pimpinell with trifid cut lower Leaves. This is the *Anisum vulgare*. Clus. Hist. Common Anise.

The 1st Sort grows naturally in Woods, and on the Side of Banks near Hedges, in several Parts of *England*. The lower Leaves of this Sort are winged, and composed of 3 Pair of Heart-shaped Lobes, terminated by an odd one; they are sharply sawed on their Edges and sit close to the Mid-rib. The lower Lobes which are the largest, are near 2 Inches long, one and a Half broad at their Base, and are of a dark green. The Stalks are more than a Foot high, dividing into 4 or 5 Branches; the lower Part of the Stalk is garnished with winged Leaves, shaped like those at the Bottom, but are smaller; those upon the Branches are short and trifid; the Branches are terminated by small Umbels of white Flowers, which are composed of smaller Umbels or Rays. The Flowers have 5 Heart-shaped Petals which turn inward, and are succeeded by 2 narrow oblong, channelled Seeds. It flowers in *July*, and the Seeds ripen in Autumn. There is a Variety of this with red Flowers, which is frequently found among the other, and rises from the same Seed.

The 2d Sort grows naturally in dry Pastures in many Parts of *England*; the lower Leaves of this are composed of 4 Pair of Lobes, terminated by an odd one; these are roundish; those on the lower Part of the Leaf are about half an Inch long, and the same Breadth; they are indented on their Edges; the Stalks rise near a Foot high, sending out 3 or 4 slender Branches garnished with very narrow Leaves. The Umbels of Flowers are smaller than those of the first, as are the Flowers and Seeds. It flowers the same Time.

The 3d Sort grows naturally in dry gravelly Pas-

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tures in several Parts of *England*; the lower Leaves of this Sort have 5 or 6 Pair of Lobes terminated by an odd one; these are deeply cut almost to their Mid-rib in Form of Wings. The Stalks are slender, and rise about a Foot high, sending out a few small Branches which have a narrow trifid Leaf placed at each Joint, and are terminated by small Umbels of white Flowers composed of several Rays standing upon pretty long Foot Stalks. The Flowers are small, and appear in *July*.

The Seeds of the 4th Sort were sent me from *Paris* by Dr. Bernard de Jussieu. The lower Leaves of this Sort are composed of 6 or 7 Pair of Lobes terminated by an odd one; these are Heart shaped, almost 2 Inches long, and one and a Half broad near their Base; they are hairy, and of a pale green. The Stalk rises near 2 Feet high, dividing into several Branches which have one narrow five-pointed Leaf at each Joint, and are terminated with Umbels of white Flowers like those of the first Sort.

The Seeds of the 5th Sort I gathered in Dr. Boerhaave's private Garden near *Leyden*; the Synonyme applied to it was the Title he gave me for it, and he told me he had received the Seeds of it from *Austria*. The lower Leaves have 5 Pair of Lobes terminated by an odd one; these are placed at a wider Distance from each other than those of the other Sorts; they are near 2 Inches long, and 3 Quarters of an Inch broad in the Middle, drawing to a Point at each End, and are deeply cut in regular Jags opposite, in Form of a winged Leaf; they are of a lucid green, and have long Foot Stalks. The Stalks rise 2 Feet high, dividing at the Top into 2 or 3 slender Branches, garnished at each Joint with one Wing-pointed narrow Leaf. The Umbels of Flowers are very like the first.

All these Sorts have perennial Roots; they are propagated by Seeds, which, if sown in Autumn, will more certainly succeed, than when they are sown in Spring. When the Plants come up they will require no other Culture, but to thin them where they are too close, and keep them clean from Weeds; the second Year they will flower and produce ripe Seeds, and the Roots will abide some Years, and continue to produce Flowers and Seeds.

The 1st Sort is directed for medicinal Use, but the Herbwomen either bring the 3d Sort to Market for it or what is worse, substitute *Burnet* and *Meadow Saxifrage* in its Stead. It enters the *pulvis ari compositis*, and is esteemed good for the Gravel.

The last Sort is the common Anise; this is an annual Plant, which grows naturally in *Egypt*, but is cultivated in *Malta* and *Spain*, from which Countries the Seeds are annually brought to *England*. From these Seeds there is a distilled Water, and an Oil drawn for medicinal Use. The Pastrycooks also make great Use of these Seeds in several of their Compositions, to give them an aromatick Taste and Smell. The lower Leaves are divided into 3 Lobes, which are deeply cut on their Edges; the Stalk rises a Foot and a Half high, dividing into several slender Branches garnished with narrow Leaves, cut into 3 or 4 narrow Segments, and are terminated by large loose Umbels, composed of many smaller Umbels or Rays, which stand on pretty long Foot Stalks. The Flowers are small and of a yellowish white, the Seeds are oblong and swelling. It flowers in *July*, and if the Season proves warm, the Seeds will ripen in Autumn.

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The Seeds of this should be sown the Beginning of April, upon a warm Border, where the Plants are to remain; when they come up, they should be thinned, and kept clean from Weeds, which is all the Culture this Plant requires, but is too tender to be cultivated in England for Profit.

PINASTER. See Pinus.

PINGUICULA, Butterwort.

This Plant is found growing upon Bogs in many Parts of England, but is never cultivated in Gardens.

PINUS. Tourn. Inst. R. H. Raii Meth. Plant. 138. Lin. Gen. Plant. 956. The Pine Tree; in French, *Pin*. The Characters are,

The male Flowers are collected in a scaly conical Bunch; they have no Petals, but many Stamina, which are connected at their Base, but divide at the Top, terminated by erect Summits; these are included in the Scales, which supply the Want of Petals and Empalement. The female Flowers are collected in a common oval Cone, and stand at a Distance from the male on the same Tree. Under each Scale of the Cone is produced 2 Flowers, which have no Petals, but a small Germen supporting an Awl-shaped Style, crowned by a single Stigma. The Germen becomes an oblong oval Nut, crowned with a Wing, included in the rigid Scale of the Cone.

The Species are,

1. **PINUS foliis geminis crassiusculis glabris, conis pyramidalis acutis.** Pine Tree with 2 thick smooth Leaves in each Sheath, and pyramidal acute Cones. This is the *Pinus sylvestris* C. B. The wild Pine or Pineaster.

2. **PINUS foliis geminis tenuioribus glauis, conis subrotundis obtusis.** Pine Tree with two narrower gray Leaves coming out of each Sheath, and roundish blunt Cones. This is the *Pinus sativa*, C. B. P. 490. The cultivated Pine Tree, commonly called the Stone Pine.

3. **PINUS foliis geminis brevioribus glaucis, conis parvis mucronatis.** Pine Tree with two shorter gray Leaves proceeding out of each Sheath, and small acute-pointed Cones. This is the *Pinus sylvestris foliis brevibus glaucis, conis parvis albis.* Raii Syn. 2. 288. Wild Pine with shorter gray Leaves, and small whitish Cones, called *Scotch Fir* or Pine.

4. **PINUS foliis geminis brevioribus latiusculis glaucis, conis minimis.** Pine Tree with two shorter broad Leaves in each Sheath which are gray, and the smallest Cones, commonly called *Tartarian Pine*.

5. **PINUS foliis sepius ternis tenuioribus viridibus, conis pyramidalis, squamis obtusis.** Pine with three narrow green Leaves often in each Sheath, and pyramidal Cones with blunt Scales. *Pinus sylvestris montana altera.* C. B. P. Another wild Mountain Pine, called *Mugho*.

6. **PINUS foliis quinis levibus, H. Scan. 32. Lin. Sp. Plant. 1000.** Pine Tree with five smooth Leaves in each Sheath. *Pinus sylvestris montana tertia.* C. B. P. 491. The third wild Mountain Pine, called *Cembro*.

7. **PINUS foliis geminis longioribus glabris, conis longioribus tenuioribusque.** Pine Tree with two longer smooth Leaves in each Sheath, and longer narrower Cones. This is the *Pinus maritima secunda.* Tabern. Icon. 937. The second maritime Pine.

8. **PINUS foliis geminis tenuissimis, conis obtusis, ramis patulis** Tab. 208. Pine Tree with two narrow Leaves in each Sheath, obtuse Cones, and spreading Branches.

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This is the *Pinus Halepensis, foliis tenuibus late viridibus.* Rand. Hort. Chelf. Cat. 158. *Aleppo Pine* with very narrow dark green Leaves.

9. **PINUS Virginiana foliis binis brevioribus & crassioribus setis, minori cono singulis squamarum capitibus aculeo donatis.** Pluk. Alm. 297. *Virginian Pine* with two shorter and thicker Leaves in each Sheath, and a smaller Cone with each Scale ending in a Prickle, commonly called *Jersey Pine*.

10. **PINUS foliis ternis, conis longioribus squamis rigidioribus.** Pine Tree with three Leaves, and longer Cones having rigid Scales, commonly called three-leaved *Virginian Pine*.

11. **PINUS foliis longioribus tenuioribus ternis, conis maximis laxis.** Pine Tree with three longer narrower Leaves, and the largest loose Cones. This is the *Pinus Virginiana tenuifolia tripilis* s. *ternis plerumque ex uno folliculo setis strobilis majoribus.* Pluk. Alm. 297. *Virginian Pine* Tree with three narrow Leaves in each Sheath, and larger Cones, called the *Frankincense Tree*.

12. **PINUS Virginiana p. longis foliis tenuioribus, cono echinato gracili.** Pluk. Alm. 297. *Virginian Pine* with longer and narrower Leaves, and a slender prickly Cone, called three-leaved *Bastard Pine*.

13. **PINUS foliis quinq. scabris.** Lin. Sp. Plant. 1000. Pine Tree with five rough Leaves in each Sheath. This is the *Pinus foliis longissimis ex una theca quinis.* Cold. Novch. 229. Pine Tree with five long Leaves in each Sheath, commonly called *Lord Weymouth's Pine*.

14. **PINUS foliis ternis longissimis.** Pine Tree with the longest Leaves growing by Threes out of each Sheath. This is the *Pinus Americana palustris trifolia, foliis longissimis.* Du Hamel. Three leaved *Marsh American Pine*, with the longest Leaves.

There are some other Species of this Genus in *America*, which have not been sufficiently examined to ascertain their Differences; and it is probable some of the *European* Kinds, which are now supposed to be only Varieties of the Sorts here enumerated, may be distinct Species; but as I have had no Opportunities of seeing them, so I have omitted them here.

The 1st Sort here enumerated is the *Pineaster*, or wild Pine, which grows naturally on the Mountains in *Italy*, and the South of *France*, where there are Forests of these Trees, which, if suffered to stand, grow to a large Size; but in *Switzerland* they are frequently cut into Shingles for covering their Houses, and for making Pitch; and in the South of *France*, the young Trees are cut for Stakes to support their Vines. This grows to a large Size, the Branches extend on every Side to a considerable Distance, and while the Trees are young, they are fully garnished with Leaves, especially where they are not so close as to exclude the Air from those within; but as they advance in Age, the Branches appear naked, and all those which are situated below, become unsightly in a few Years, for which Reason they have not been much in Esteem of late Years; for as the Wood of the *Scotch Fir* is much preferable to this, and the Branches being generally better garnished with Leaves, so the latter has been more generally propagated. The Branches of this Sort grow at a wider Distance than those of the *Scotch Pine*, and are more horizontal; the Leaves are much larger, thicker, and longer

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and grow strait, have a broad Surface on their Inside, which has a Furrow or Channel running longitudinally; they are of a darker green, and their Points are obtuse. The Cones of this are 7 or 8 Inches long, pyramidal, and have pointed Scales; the Seeds are oblong, a little flattened on their Sides, and have narrow Wings on their Tops.

The 2d Sort, which is generally called the Stone Pine, is very common in *Italy*; but I much doubt of the Country where it grows naturally, for so far as I have been able to learn, there are none of these Trees growing in any Part of *Italy*, but where they have been planted, or where the Seeds have scattered from planted Trees; and I have frequently received the Seeds of a Pine from *China*, which were taken out of the Cones so like those of this Sort, as not to be distinguished from them; but these have never grown, either by their being too old, or from their having been taken out of the Cones; for if the Seeds of Pines are kept in the Cones they will grow at ten or twelve Years old; but when they are out of their Cones, they seldom grow well after two Years, and some Sorts do not grow after one Year. The Leaves of this are not quite so long as those of the former Sort, and are of a grayish or sea-green Colour; the Cones are not more than five Inches long, but are very thick, roundish, and end in an obtuse Point; the Scales of the Cones are flat, the Seeds are more than twice the Size of those of the former. The Kernels of these are frequently served up in Desserts to the Table during the Winter Season in *Italy*, and formerly they were used in Medicine here, but of late Years the Pistachia Nuts have been generally substituted in Lieu of them. The Wood of this Tree is white, not so full of Resin as many of the other Sorts, so is never cultivated for its Wood, but chiefly for the Beauty of its Leaves and for the Nuts, which are much esteemed in the South of *France*, and in *Italy*.

The 3d Sort is generally known here by the Title of *Scotch Pine*, from its growing naturally in the Mountains of *Scotland*; but it is common in most Parts of *Europe*, and Monsr. *Du Hamel* of the *Royal Academy of Sciences* at *Paris*, mentions his having received Cones of this Tree from *St. Domingo* in the *West Indies*, so concludes that it grows indifferently in torrid, frozen, and temperate Zones. It is by *John Baubin* titled, *Pinus sylvestris, Genevensis vulgaris*; so that it grows commonly in the Mountains near that City, and all through *Denmark*, *Norway*, and *Sweden*. The Wood of this Tree is the red or yellow Deal, which is the most durable of any of the Kinds yet known; the Leaves of this are much shorter than those of the former Sorts, and are broader, of a grayish Colour, and twisted, growing two out of each Sheath; the Cones are small, pyramidal, and end in narrow Points; they are of a light Colour, and the Seeds are small.

This Sort grows well upon almost every Soil; I have planted Numbers of the Trees upon Peat, where they have made great Progress. I have also planted them in Clay, where they have succeeded far beyond Expectation; and upon Sand, Gravel, and Chalk, they likewise thrive as well; but as they do not grow near so fast upon Gravel and Sand, as upon moist Ground, so the Wood is much preferable; for those Trees which

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have been cut down upon moist Soils, where they have made the greatest Progress, when they have been sawn out into Boards, have not been valuable, the Wood has been white and of a loose Texture; whereas those which have grown upon dry gravelly Ground, have proved nearly equal to the best foreign Deals; and I doubt not but those Plantations which of late Years have been made of these Trees, will, in the next Age, not only turn greatly to the Advantage of their Possessors, but also become a national Benefit.

The 4th Sort grows naturally in *Tartary*, from whence I received the Seeds. This hath a great Resemblance to the *Scotch Pine*, but the Leaves are broader, shorter, and their Points more obtuse; they emit a strong balsamick Odour when bruised; the Cones of this are very small, as are also the Seeds, some of which were black, and others white; but whether they are from different Trees or the same, I could not learn; for the Seeds were taken out of the Cones, but in the Parcel there was one entire Cone.

The 5th Sort grows naturally upon the Mountains in *Switzerland*; this hath very narrow green Leaves, which grow sometimes by Pairs, and at others there are 3 coming out of each Sheath; these generally stand erect; the Cones are of a middle Size, and pyramidal; the Scales are flat, having each a small obtuse Rising, but are very compact, till they are opened by the Warmth of the Sun the second Spring. The Seeds of this are much less than those of the Pineaster, but larger than those of the *Scotch Pine*.

The 6th Sort grows naturally in *Switzerland*, and is supposed to be the same as the *Siberian*, which I greatly doubt; for the Cones of this are short and roundish, and the Scales are close, whereas those of the *Siberian Pine* are long and looser; the Leaves have a near Resemblance to each other, so far as I have observed in the Specimens; but the Plants which have been raised from the *Switzerland* Seeds, have made much greater Progress than those from the *Siberian* Seeds, which can scarce be kept alive in *England*. The Leaves are long and narrow, smooth to the Touch of a light green, and 5 of them come out from the same Sheath; the Branches are closely garnished with them; the Cones are about 3 Inches long, the Scales are pretty close; the Seeds large, and their Shells easily broken.

The 7th Sort grows in the maritime Parts of *Italy* and the South of *France*; this hath long smooth Leaves, growing by Pairs in each Sheath; the Cones are very long and slender; the Seeds are about the Size of those of the Pineaster.

The 8th Sort grows naturally near *Aleppo*, and in several other Parts of *Syria*. This is a Tree of middling Growth in its native Soil, and in *England* there are none of any large Size, for most of the Plants which were growing here before the Year 1740, were killed by the Frost that severe Winter; the two largest which I have seen are growing at *Goodwood* in *Suffex*, the seat of his Grace the Duke of *Richmond*; these had been transplanted thither the Year before, so had scarce recovered their Removal, and had made no Shoots that Summer, therefore escaped much better than those Plants which were in great Vigour, most of which were destroyed. This Tree branches out on every Side near the Root; the

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the Branches at first grow horizontally, but turn their Ends upward; their Bark, is smooth, and of a dark gray Colour. The Leaves are long and very narrow, of a dark green, and grow by Pairs in each Sheath; if bruised, they emit a strong resinous Odour. The Cones come out from the Side of the Branches, they are not more than half the Length of those of the Pineaster, and full as large at their Base; the Scales are flatted, and the Point of the Cone obtuse. The Seeds are much less than those of the Pineaster, but of the same Shape.

The 9th Sort grows naturally in most Parts of *North America*; this never rises to any great Height, and is the least esteemed in the Country of all the Sorts. While the Plants are young, they make a pretty good Appearance; but when they get 7 or 8 Feet High they become ragged and unsightly, so are not worth cultivating.

The 10th Sort grows naturally in *Virginia*, and other Parts of *North America*, where it rises to a great Height; and so far as we can judge by the Growth of those Trees which are now here, it seems likely to become a large Tree in *England*. Many of them are now growing in the noble Plantation of ever-green Trees in his Grace the Duke of Bedford's Park at *Woburn*, which are 20 Feet high, though not of many Years standing, and keep Pace with the other Kinds of Pines and Firs in the same Plantation. The Leaves are long, 3 generally standing in each Sheath; the Cones come out in Clusters round the Branches; they are as long the Cones of the Pineaster, and have rigid Scales; the Seeds are winged, and nearly as large as those of the Pineaster.

The 11th Sort grows naturally in *North America*; this hath very long narrow Leaves, growing by Threes out of each Sheath; the Cones are as large as those of the Stone Pine, but the Scales are looser, and the Cones more pointed. The Scales open horizontally, and discharge the Seeds. This Sort was sent from *America* to Mr. Ball of *Exeter*, and also to Dr. Compton Bishop of *London*, by the Title of Frankincense Pine.

The 12th Sort grows naturally in *Virginia*: the Cones of this have been brought to *England* of late by the Title of Bastard three-leaved Pine. The Leaves of this Sort are long and narrow, sometimes there are three growing in each Sheath, and at others but two; the Cones are long, slender, and their Scales terminate in sharp Points; they are rather longer than those of the Pineaster, and not so thick.

The 13th Sort grows naturally in most Parts of *North America*, where it is called the white Pine. It is one of the tallest Trees of all the Species, often growing a hundred Feet high in those Countries, as I have been credibly informed; the Bark is very smooth and delicate, especially when young; the Leaves are long and slender, five growing out of each Sheath; the Branches are pretty closely garnished with them, so make a fine Appearance; the Cones are long, slender, and very loose, opening with the first Warmth of the Spring, so that if they are not gathered in Winter, the Scales open and let out the Seeds. The Wood is esteemed for making Masts for Ships; it is in *England* titled Lord Weymouth's, or *New England* Pine. As the Wood of this Tree was generally thought of great Service to the Navy, there was a Law made in the ninth Year of Queen Anne for the Preservation of the Trees, and to encourage their

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Growth in *America*, and it is within thirty Years past these Trees began to be propagated in *England* in any Plenty, though there were some large Trees of this Sort growing in two or three Places long before, particularly at Lord Weymouth's, and Sir Wyndham Knatchbull's in *Kent*, and it has been chiefly from the Seeds of the latter that the much greater Number of these Trees now in *England* have been raised, for although there has annually been some of the Seeds brought from *America*, yet those have been few in Comparison to the Produce of the Trees in *Kent*, and many of the Trees, which have been raised from the Seeds of those Trees, now produce Plenty of good Seeds, particularly those in the Gardens of his Grace the Duke of Argyle at *Whitton*, which annually produce large Quantities of Cones which his Grace most generously distributes to all the Curious.

This Sort and the *Scotch* Pine are the best worth cultivating of all the Kinds for the Sake of their Wood; the others may be planted for Variety in Parks, &c. where they make a good Appearance in Winter, when other Trees are destitute of Leaves.

All the Sorts of Pines are propagated by Seeds which are produced in hard woody Cones; the Way to get out their Seeds is to lay the Cones before a gentle Fire, which will cause the Cells to open, and then the Seeds may be easily taken out. If the Cones are kept entire the Seeds will remain good some Years, so that the surest Way to preserve them is to let them remain in the Cones, until the Time for sowing; if the Cones are kept in a warm Place in Summer, they will open, and emit the Seeds, but if they are not exposed to much Heat, they will remain entire some Years, especially those which are close and compact; and the Seeds, which have been taken out of Cones of seven Years old, have grown very well, so that these may be transported to any Distance, provided the Cones are well ripened, and put up dry.

The best Time for sowing the Seeds of Pines is about the End of *March*, and when the Seeds are sown, the Place should be covered with Nets to keep off Birds, otherwise, when the Plants begin to appear with the Husk of the Seed on their Tops, the Birds will pick off the Heads of the Plants, and destroy them.

Where the Quantity of Seeds to be sown is not great, it will be a good Way to sow them either in Boxes or Pots, filled with light loamy Earth, which may be removed from one Situation to another, according to the Season of the Year; but if there is a large Quantity of Seeds, so as to require a good Space to receive them, they should be sown on an East or North-east Border, where they may be screened from the Sun, whose Heat is very injurious to these Plants at their first Appearance above Ground. Those Seeds, which are sown in Pots or Boxes, should be placed in a shady Situation, but not under Trees, and if they are screened from the Sun with Mats when the Plants first come up, it will be a good Method to preserve them.

Most of the Sorts will come up in about 6 or 7 Weeks after they are sown, but the Seeds of the Stone or cultivated Pine, and 2 or 3 of the others, whose Shells are very hard, frequently lie in the Ground a whole Year, so that when the Plants do not come up the first Year, the Ground should not be disturbed, but kept clean;

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clean from Weeds, and the following Spring the Plants will rise. This frequently happens in dry Seasons, and when they are sown in Places a little too much exposed to the Sun.

When the Plants appear, they must be constantly kept clean from Weeds, and in very dry Seasons, if they are now and then gently refreshed with Water, it will forward their Growth, but this must be done with great Care and Caution, for if they are hastily watered, it will wash the tender Plants out of the Ground, or lay them down flat, which often rots their Shanks, and when this is too often repeated, it will have the same Effect, so that unless it is judiciously performed, it will be the best Way to give them none, but only screen them from the Sun.

If the Plants come up too close, it will be a good Method to thin them gently about the Beginning of July. The Plants, which are drawn up, may then be planted on other Beds which should be prepared ready to receive them, for they should be immediately planted as they are drawn up, because their tender Roots are soon dried and spoiled at this Season of the Year. This Work should be done (if possible) in cloudy or rainy Weather, and then the Plants will draw out with better Roots, and will soon put out new Fibres again, but if the Weather should prove clear and dry, the Plants should be shaded every Day from the Sun with Mats, and now and then gently refreshed with Water. In drawing up the Plants, there should be great Care taken not to disturb the Roots of those left remaining in the Seed Beds, &c. so that if the Ground be hard, the Beds should be well watered some Time before the Plants are thinned, to soften and loosen the Earth, and, if after the Plants are drawn out, the Beds are again gently watered to settle the Earth to the Roots of the remaining Plants, it will be of great Service to them, but it must be done with great Care, so as not to wash out their Roots, or lay down the Plants. The Distance, which should be allowed these Plants, is 4 or 5 Inches Row from Row, and 3 Inches in the Rows.

In these Beds the Plants may remain till the Spring twelve Months after, by which Time they will be fit to transplant where they are to remain; the younger the Plants are, when planted out, the better they will succeed, for although some Sorts will bear transplanting at a much greater Age, yet young Plants planted at the same Time will in a few Years overtake the large ones, and soon outstrip them in their Growth; there is also an Advantage in planting young, by saving the Expence of staking, and much watering, which large Plants require. I have several Times seen Plantations of several Sorts of Pines, which were made of Plants 6 or 7 Feet high, and at the same Time others of one Foot high planted between them, which in ten Years were better Trees than the old ones, and much more vigorous in their Growth; but if the Ground, where they are designed to remain, cannot be prepared by the Time before-mentioned, the Plants should be planted out of the Beds into a Nursery, where they may remain two Years, but not longer, for it will be very hazardous removing these Trees at a greater Age.

The best Season to transplant all Sorts of Pines is about the latter End of March, or the Beginning of

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April, just before they begin to shoot; for although the Scotch Pine, and some of the most hardy Sorts, may be transplanted in Winter, especially when they are growing in strong Land, where they may be taken up with Balls of Earth to their Roots, yet I would not advise this for common Practice, having frequently seen it attended with bad Consequences, but those which are removed in the Spring rarely fail.

Where these Trees are planted in exposed Situations, they should be put pretty close together, that they may shelter each other, and when they have grown a few Years, Part of them may be cut down to give Room for the others to grow; but this must be gradually performed, lest by too much opening the Plantation at once, the Air should be let in among the remaining Trees with too great Violence, which will stop their Growth.

Although these ever-green Trees are by many Persons despised on account of their dark green in Summer, yet a proper Mixture of these in large Clumps make a fine Appearance about a Seat in Winter, and in Summer, by their Contrast with other Trees, have no bad Effect in diversifying the Scene.

Where large Plantations are designed to be made, the best Method will be to raise the Plants either upon a Part of the same Land, or as near to the Place as possible, and also upon the same Sort of Soil; a small Piece of Ground will be sufficient to raise Plants enough for many Acres, but, as the Plants require some Care in their first raising, if the neighbouring Cottagers, who have many of them small Inclosures adjoining to their Cottages, or where this is wanting a small Inclosure should be made them for the Purpose of raising the Plants, and they are furnished with the Seeds and Directions for sowing them, and managing the young Plants, till they are fit for transplanting, the Women and Children may be usefully employed in this Work, and the Proprietors of Land agreeing with them to take their Plants, when raised, at a certain Price, it would be a great Benefit to the Poor, and hereby they would be engaged to have a Regard for the Plantations when made, and prevent their being destroyed.

The Scotch Pine, as was before observed, being the hardiest of all the Kinds, and the Wood of it the most useful, is the Sort which best deserves Care. This will thrive upon the most barren Sands, where scarce any Thing else except Heath and Furze will grow, so that there are many thousand Acres of such Land lying convenient for Water Carriage, which at present is of little Benefit to any Body, that might, by Plantations of these Trees, become good Estates to their Proprietors, and also a national Benefit; and as the Legislators have taken this into their Consideration, and already passed some Laws for the encouraging these Plantations, as also for their Preservation and Security, so it may be hoped that this will be undertaken by the Gentlemen who are possessed of such Lands in all the different Parts of the Kingdom, with proper Spirit, for although they may not expect to receive much Profit from these Plantations in their own Time, yet their Successors may with large Interest, and the Pleasure which these growing Trees will afford them, by beautifying the present dreary Parts of the Country, will in some Measure recompence them for their Trouble and Expence, and

and by creating Employment for the Poor, lessen those Rates which are now so high in many Parts of *England*, as scarce to be borne.

The Expence of making these Plantations deters most People from engaging in them, but the greatest of the Expence is that of fencing them from Cattle, &c. the other is trifling, as there will be no Necessity for preparing the Ground to receive the Plants, and the Charge of planting an Acre of Land with these Plants will not be more than twenty Shillings where Labour is dear, exclusive of the Plants, which may be valued at forty Shillings more. I have planted many Acres of Land with these Trees, which was covered with Heath and Furze, and have only dug Holes between to put in the Plants, and afterward laid the Heath or Furze, which was cut, upon the Surface of the Ground about their Roots to prevent the Ground drying, and few of the Plants have failed. These Plants were most of them 4 Years old from Seed, nor was their any Care taken to clean the Ground afterward, but the whole left to shift, and in 5 or 6 Years the Pines have grown so well, as to overpower the Heath and Furze, and destroy it.

The Distance which I have generally planted these in all large open Situations was about 4 Feet, but always irregular, avoiding planting in Rows as much as possible, and the chief Care is not to take up the Plants faster than they can be planted, so that some Men have been employed in digging up the Plants, while others were planting. Those who take up the Plants must be looked after to see they do not tear off their Roots, or wound their Bark, and as fast as they are taken up, their Roots should be covered to prevent their drying, and put into their new Quarters as soon as possible. In planting them Care should be had to make the Holes large enough for their Roots, as also to loosen and break the Clods of Earth, and put the finest immediately about their Roots, then to settle the Earth gently with the Foot to the Roots of the Plant. If these Things are duly observed, and a proper Season chosen for performing it, their will be very little Hazard of their succeeding, but I have seen some Plantations made with Plants which were brought from a great Distance, and had been so closely packed up, as to cause a Heat, whereby most of the Plants within had their Leaves changed yellow, and few of them have grown, which has discouraged others from planting, not knowing the true Cause of their Failure.

After the Plantations are made, the only Care for five or six Years will be to secure the Plants from Cattle, Hares, and Rabbits, for if these are admitted to them, they will make great Destruction in a short Time, for if their Branches are gnawed by Hares or Rabbits, it will greatly retard their Growth if not destroy them.

In about 5 or 6 Years after planting, the Branches of the young Trees will have met, and begin to interfere with each other, therefore they will require a little pruning, but this must be done with great Caution. The lower Tier of Branches only should be cut off; this should be performed in *September*, at which Time there will be no Danger of the Wounds bleeding too much, and the Turpentine will harden over the Wounds as the Season grows cold, so will prevent the Wet from

penetrating the Wounds. These Branches should be cut off close to the Stem of the Plants, and Care should be taken in doing this not to break any of the remaining Branches of the young Trees. This Work should be repeated every other Year, at each Time taking off only the lower Tier of Branches, for if the Plants are much trimmed, it will greatly retard their Growth, as it does in general that of all Trees, but as these Trees never put out any new Shoots where they are pruned, so they suffer more from Amputation than those which do.

In those Parts of *France*, where they have Forests of these Trees, the Proprietors always give the Faggots to those, who prune their young Trees first, for their Labour, so it costs them no Money. At the second Pruning the Proprietor has one Third of the Faggots, and the Dressers have the other two for their Work; afterward the Faggots are equally divided between the Workmen and Proprietors, but there must be great Care taken that they do not cut off more than should be.

In about 12 or 14 Years these will require no more pruning, for their upper Branches will kill those below where they have not Air, but soon after this, if the Plants have made good Progress, it may be necessary to thin them, but this should be gradually performed, beginning in the Middle of the Plantation first, leaving the Outside close to screen those within from the Cold, so by Degrees coming to them at last, whereby those, which were first thinned, will have had Time to get Strength, so will not be in Danger of suffering from the Admission of cold Air. When these Plantations are thinned, the Trees should not be dug up, but their Stems cut off close to the Ground, for their Roots never shoot again, but decay in the Earth, so there can no Harm arise by leaving them, and hereby the Roots of the remaining Plants are not injured. The Trees which are now cut will be fit for many Purposes; those which are strait will make good Putlocks for the Bricklayers, and serve for Scaffolding Poles, so that there may be as much made by the Sale of these, as will defray the whole Expence of the planting, and probably Interest for the Money into the Bargain.

As the upright Growth of these Trees renders their Wood the more valuable, they should be left pretty close together, whereby they will draw each other up, and grow very tall. I have seen some of these Trees growing, whose naked Stems have been more than seventy Feet high, and as strait as a walking Cane, and from one of these Trees there were as many Boards sawed, as laid the Floor of a Room near twenty Feet square. If these Trees are left eight Feet asunder each Way, it will be sufficient Room for their Growth, therefore if at the first Thinning a fourth Part of the Trees are taken away, the other may stand twelve or fourteen Years longer, by which Time they will be of a Size for making Ladders, and Standards for Scaffolding, and many other Purposes, so that from this Sale as much may be made, as to not only pay the remaining Part of the Expence of planting, if any should be wanting in the first, but Rent for the Land with Interest, and the standing Trees for Fortunes of younger Children. This may be demonstrated by Figures, and there has been several Examples of late Years, where

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where the Profits have greatly exceeded what is here mentioned.

The 5th Sort is called in *Switzerland* Torch Pine; the Peasants there make Use of the Wood of this Tree instead of Torches for burning. This Tree grows to a great Height in its native Soil, and is well furnished with Branches. The Wood is pretty full of Refin; and when first cut is of a reddish Colour; this is used by the Inhabitants in their Buildings.

The 6th Sort of Pine makes but slow Progress in *England*, so is not worth cultivating for Profit, unless upon the Summits of the northern Mountains, where upon the peaty Moors, this and the *Siberian* Pine are likely to succeed much better than in any other Part of *Britain*, for they naturally grow among Snow.

The 8th Sort is never a large Tree in its native Country; in *England* it grows more like a Shrub than a Tree, and is often greatly injured by Cold in Winter, and by severe Frosts sometimes killed, so that this is only kept for Variety in the *English* Gardens.

The 9th and 10th Sorts are used indifferently by the Inhabitants of *North America* for their Buildings, and the same Purposes as the other Sorts of Pine.

There are some Varieties of these in *America*, if not distinct Species. Some of them ripen their Cones the first Year, but others are 2 Years, and some 3 before they are ripe, but as these have not been well distinguished by those who reside in that Country, and there are few of the Sorts so large as to produce Cones, so their Differences cannot as yet be ascertained.

The 11th and 12th Sorts I believe are indifferently called red Pine in *North America*, where their Wood is greatly esteemed; the *French* at *Canada* have built a sixty Gun Ship entirely of this Wood, called the *Saint Laurent*. I have had a little of this Wood from *America*, which was very like that of the *Scotch* Pine, but had rather more Refin. It may not be amiss to make Trial of some of these Sorts in Plantations, to see which may deserve to be propagated; for in some Places where they are growing they thrive very well, but these will not succeed so well on dry Land as moist.

The 13th Sort is called the white Pine in most Parts of *North America*; of this I believe there are 2 Varieties if not distinct Species, but as they have not been well examined by Persons of Skill, we cannot take upon us to determine this, for *Monfieur Gaultier's* Description of one Species is very different from that of the *Weymouth* Pine, and yet he has applied the Title of white Pine to both.

This Sort deserves to be propagated for its Beauty, which is superior to all the Sorts of Pines yet known in *England*. The Bark of the young Trees, and the Branches are perfectly smooth; the Branches are well garnished with Leaves; these are long, and of an agreeable green, so that in Summer they have a Beauty, and in Winter they make a better Appearance than any of the Sorts. The Wood of this Tree is very useful, especially for Masts of Ships, as the Trees grow very tall and strait, and are pliable, so do not break with the Wind, therefore the Legislators thought proper to pass a Law for the Preservation and Increase of them in *America*, but as these Trees will thrive in *England*, they may be propagated in many places where the Soil

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is proper for them. This Sort grows best upon a moist light Soil, but it should no be too wet; it will also thrive on a loamy Soil if it is not too much approaching to Clay. The Seeds of this should be sown with a little more Care than those of the *Scotch* Pine, because their Stems are not so strong, therefore are more apt to go off while young, so if these are sown in the full Ground, the Bed should be screened with Mats from the Sun every Day, but exposed to the Dews every Night. When the Plants come up, they should be treated as before directed for the *Scotch* Pine, and if all the Plants of this Kind are transplanted into Beds in *July*, it will be a secure Way to preserve them, but as these Plants will grow faster than those of the *Scotch* Pine, they should be planted farther asunder; their Rows should be 6 Inches distant, and in the Rows they should be 4 Inches apart. This will allow them Room to grow till the Spring twelve Month following, when they may be either transplanted where they are to remain, or into a Nursery where they may stand two Years to get Strength, but the sooner they are planted where they are to stand, the less Danger there will be of their succeeding, and the larger they will grow, for although they will bear transplanting at a greater Age, yet when they are planted young, they will make much greater Progress, and grow to a greater Size.

The Soil in which this Sort thrives best is a soft Hazel Loam not too wet, in which I have frequently measured Shoots of one Year, which were two Feet and a Half long, and have for some Years continuing growing so much; they should have a sheltered Situation, for I have observed where the Trees have been much exposed to the South-west Winds, they have not made near so great Progress as those which grew in Shelter, and where there have been Plantations of these Trees, those on the Outside have not kept Pace with the Middle, nor have their Leaves retained the Verdure so well.

The 14th Sort grows naturally on Swamps in many Parts of *North America*, where I have been informed they grow to the Height of 25 or 30 Feet. Their Leaves are a Foot or more in Length, growing in Tufts at the End of the Branches, so have a singular Appearance, but I have not heard the Wood was of any Use but for Fuel, and there are few Places here where these Plants do well, for in very severe Frosts their leading Shoots are often killed, and in dry Ground they will not thrive; so that unless the Soil is adapted for them, it is to little Purpose planting them.

From the wild Pine or Pineaster is procured the common Turpentine chiefly used by Farriers, and from it is distilled the Oil of Turpentine. The finer and more valuable Part, which comes first, is called the Spirit, what is left at the Bottom of the Still is the common Refin.

The Kernels of the Nuts of the manured or Stone Pine are of a balsamick nourishing Nature, good for Consumptions, Coughs, and Hoarseness, restorative, and of Service after long Illness.

PIPER. *Lin. Gen. Plant.* 42. *Saururus. Plum. Nov. Gen.* 51. *Tab.* 12. Pepper, or Lizards-tail.

The Characters of this Genus are,

The Flowers are closely fastened to a single Stalk, and have no complete Sheath; these have no Petals nor Stamina, but

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but have two Summits opposite to the Root of the Germen, which are roundish; they have a large oval Germen, but no Style, crowned by a prickly triple Stigma. The Germen afterward becomes a roundish Berry with one Cell, containing one globular Seed.

The Species are,

1. *PIPER foliis obversis ovatis enerviis*. Lin. Sp. Plant. Pepper with obverse oval Leaves Veins. This is the *Saururus bumilis*, folio carnosio, subrotundo. Plum. Cat. Low Lizards-tail with a fleshy roundish Leaf.

2. *PIPER foliis cordatis petiolatis, caule herbaceo*. Lin. Sp. Plant. 30. Pepper with Heart-shaped Leaves having Foot Stalks, and an herbaceous-Stalk. *Piper foliis cordatis, caule procumbente*. Hort. Cliff. 6. Pepper with Heart-shaped Leaves, and a trailing Stalk.

3. *PIPER foliis lanceolato-ovatis quinquenerviis rugosis*. Lin. Sp. Plant. 29. Pepper with rough, Spear-shaped, oval Leaves having five Veins.

4. *PIPER foliis lanceolatis nervosis rigidis sessilibus*. Pepper with stiff, Spear-shaped, veined Leaves sitting close to the Branches. This is the *Piper longum humilis*, fructu à summitate caulis prodeunte. Sloan. Cat. Jam. 45. Dwarf long Pepper with the Fruit coming out at the End of the Stalk.

5. *PIPER foliis peltatis orbiculato-cordatis obtusis repandis, spicis umbellatis*. Lin. Sp. Plant. 30. Pepper with Target-formed Leaves which are orbicular, Heart-shaped, obtuse, recurved, and have Spikes growing in Umbels. This is the *Saururus arborens*, foliis amplis, rotundis & umbilicatis. Plum. Cat. 51. Tree Lizards-tail with large, round, Navel-shaped Leaves.

6. *PIPER foliis lanceolato-ovatis nervosis, spicis brevibus*. Pepper with Spear-shaped, oval, veined Leaves, and short Spikes. *Saururus frutescens, laurocerasti, folio, fructu breviori & crassiore*. Houst. Mff. Shrubby Lizards-tail with a Laurel Leaf, and a shorter thicker Fruit.

7. *PIPER foliis ovato-lanceolatis tomentosis, caule arborecente*. Pepper with oval, Spear shaped, woolly Leaves, and a Tree-like Stalk. *Saururus arborens, latifolia, villosa, fructu gracili*. Houst. Mff. Broad-leaved, Tree-like, hairy Lizards-tail with a slender Fruit.

8. *PIPER foliis ovato-lanceolatis, nervis alternis, spicis uncinatis*. Lin. Sp. Plant. 29. Pepper with oval Spear-shaped Leaves having alternate Veins, and crooked Spikes. This is the *Saururus arborens fructu adunco*. Plum. Cat. 51. Lizards-tail with a crooked Fruit.

9. *PIPER foliis ovato-lanceolatis, acuminatis nervis alternis, spicis gracilibus uncinatis*. Pepper with oval, Spear-shaped, acute-pointed Leaves having alternate Veins, and slender crooked Spikes.

10. *PIPER foliis cordato-ovatis nervosis acuminatis, spicis reflexis*. Pepper with oval, Heart-shaped, nerved, acute-pointed Leaves, and reflexed Spikes. This is the *Saururus frutescens plantaginis folio ampliore, fructu breviori & graciliore adunco*. Houst. Mff. Shrubby Lizards-tail with a larger Plantain Leaf, and a shorter and slenderer crooked Spike.

11. *PIPER foliis cordatis subsptinerviis venosis*. Flor. Zeyl. 29. Pepper with Heart-shaped Leaves which are veined, and have almost seven Nerves.

12. *PIPER foliis cordatis quinquenerviis reticulatis*. Lin. Sp. Plant. 29. Pepper with Heart-shaped, netted Leaves having five Veins. This is the *Saururus botryoides major*,

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foliis plantaginis. Plum. Cat. 51. Greater Lizards-tail with Plantain Leaves.

13. *PIPER foliis ovato-lanceolatis acuminatis glabris trinerviis*. Pepper with oval, Spear-shaped, acute-pointed, smooth Leaves having three Veins. This is the *Saururus racemosus, seu botryoides minor*. Plum. Cat. 51. Small branching or clustered Lizards-tail.

14. *PIPER foliis lanceolato-ovatis rugosis, nervis alternis*. Pepper with Spear-shaped, oval, rough Leaves having alternate Veins. This is the *Saururus racemosus, seu botryoides major*. Plum. Cat. 51. Greater branching, or clustered Lizards-tail.

The 1st Sort grows naturally in many of the Islands in the West-Indies. This sends out from the Root many succulent herbaceous Stalks almost as large as a Man's little Finger; they are jointed, and divide into many Branches, never rising above a Foot high, but generally spread near the Ground, putting out Roots at each Joint, so propagate very fast, and soon cover a large Space of Ground. The Leaves are very Thick and succulent; they are about 3 Inches long, and 2 broad, very smooth and entire. The Foot Stalk, which sustains the Spike or Tail, comes out at the End of the Branches; this is also very succulent, and the whole Length including the Spike is about 7 Inches. The Spike is strait, erect, and about the Size of a Goose Quill, closely covered with small Flowers which require a Glass to be distinguished, so have no Beauty; but the whole Spike much resembles the Tail of a Lizard, for which Plumier gave it that Title.

These Spikes appear great Part of the Year, but they rarely have any Seeds in England; the Plants increase very fast by their Stalks, which put out Roots. It requires a warm Stove to preserve it in England, and should have but little Wet, especially in Winter. If the Plants are plunged into the Tan Bed in the Stove, the Stalks will put out Roots into the Tan, so may be cut off to make new Plants.

The 2d Sort grows naturally in the West-Indies; this is annual. The Stalks are herbaceous and succulent; they rise about 7 or 8 Inches high; the Leaves are Heart-shaped, an Inch and a Half long, and three Quarters of an Inch broad; the Spikes of Flowers come out at the End of the Stalks; they are slender, about an Inch long, and strait; the Flowers are very small, and sit close to the Foot Stalk. These appear in July, and are succeeded by very small Berries, each containing a small Seed like Dust. If these Seeds are permitted to scatter on the Pots near it, the Plants will come up without Trouble; or if the Seeds are saved, and sown upon a hot Bed in Spring, the Plants will rise easily. These should be transplanted into separate Pots, and plunged into a hot Bed of Tanners Bark, treating them in the same Way as other tender Plants, but they should not have much Wet.

The 3d Sort grows naturally in Jamaica and Barbadoes. This hath several crooked Stems, which rise to the Height of 12 or 14 Feet, which are jointed, hollow, and pithy; these divide into many small Branches, which are garnished with Spear-shaped oval Leaves about 3 Inches and a Half long, and one and a Half broad; they are rough, and have 5 longitudinal Veins. The Spikes come out at the End of the Branches;

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they are slender, and about 3 Inches long; these have many small Flowers sitting close to the Foot Stalk, which are succeeded by small Berries.

The 4th Sort grows naturally in *Jamaica*. The Stalks of this are slender, and frequently trail upon the Ground, putting Roots out from their Joints like the first; they are garnished with stiff Spear-shaped Leaves 5 Inches long, and 2 broad in the Middle, drawing to a Point at each End; they have one strong Mid-rib, and on the Backside have several Veins running from that to the Sides. The Spike of Flowers is very slender, and about 5 Inches long, shaped like those of the former Sorts.

The 5th Sort grows naturally in *Jamaica*; this hath a pretty thick spongy Stalk, which rises 15 Feet high, dividing into several Branches which are jointed, and pithy. The Leaves are almost round; the Foot Stalk is fastened to the under Side, so that the upper Surface has a Mark like a Navel where the Stalk joins, and from that Center run out the Veins to the Side. The Leaves are about a Foot Diameter; their lower Part is indented like a Heart, but the other Part is round, and the Stalk being fixed toward the Middle, the Leaves have the Appearance of a Target. The Spikes are small, and grow in Form of an Umbel.

The 6th Sort grows naturally at *La Vera Cruz* in *America*. This hath shrubby jointed Stalks, which rise 9 or 10 Feet high, dividing into smaller Branches, garnished with Spear-shaped oval Leaves 7 Inches long, and 3 broad, ending in acute Points; they are veined and rough, of the same Consistence with Laurel Leaves. The Spikes of Flowers come out from the Side of the Branch at the Joints, opposite to the Leaves; they are not more than one Inch and a Half long, about the Thickness of a small Quill, and are closely set with Flowers like the other Sorts.

The 7th Sort was discovered at *La Vera Cruz*. This hath hollow pithy Stalks, which rise 12 or 14 Feet high, dividing into many crooked Branches having swelling Joints, which are garnished with oval Spear-shaped Leaves, about 5 Inches long and 3 broad, having many Veins, and are covered with a woolly Down. The Spikes of Flowers come out from the Side of the Branches opposite to the Leaves, they are slender and about 3 Inches long, turning downward.

The 8th Sort grows naturally in *Jamaica*; this hath many hollow Stalks, which rise about 5 Feet high; the Joints are pretty close and protuberant; these divide into smaller Branches, which are garnished with oval Spear-shaped Leaves, 7 Inches long and 3 broad in the Middle; they are rough and veined, the Veins coming out alternately from the Mid-rib, diverging to the Sides, and join the Borders of the Leaf at the Top. The Spikes of Flowers come out from the Side of the Branches, opposite to the Leaves; they are slender, 5 Inches long, and are incurved; these are closely set with small Flowers their whole Length. This is called *Spanish Elder* in the *West-Indies*.

The 9th Sort was sent me by Mr. Robert Millar from *Panama*, near which Place he found it growing naturally. This hath several pithy Stalks, which rise about 5 Feet high, and divide into many small Branches, garnished with oval Spear-shaped Leaves, ending in acute

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Points; these have many Veins, coming out alternately from the Mid-rib. The Spikes of Flowers are very slender, about 3 Inches long, and are incurved.

The 10th Sort was sent me from *Cartagena* by the late Dr. *Houssun*; this rises with several shrubby Stalks 15 Feet high, dividing into many slender Branches with protuberant Joints garnished with Heart-shaped oval Leaves, 5 Inches long and 3 broad, ending in acute Points; they are smooth, and at their Base have 5 Veins, but the 2 outer join the Borders of the Leaves soon; the other 3 run to the Top, the middle one in a right Line, the two Side Veins diverge, and join again at the Top; the Leaves are of a dark green on their upper Side, but pale on their under. The Spikes of Flowers come out from the Side of the Branches, they are extremely slender, an Inch and a Half long, and are reflexed at the End like a Scorpion's Tail.

The 11th Sort was sent me by Mr. Robert Millar from *Panama*, near which Place it grows naturally. This hath hollow shrubby Stalks which rise about 4 Feet high, and divide into many small Branches, which are garnished with Heart-shaped Leaves about 5 Inches long, and 4 broad near their Base, ending in long acute Points; these have 7 Veins at their Base, but the two outer soon diverge to the Borders of the Leaves, and unite with them; the other five are extended almost the Length of the Leaves, diverging from the Mid-rib toward the Sides, and unite toward the Top. The Spikes come out from the Side of the Branches, they are slender, and about 4 Inches long, bending in the Middle like a Bow, and are closely set with small herbaceous Flowers, which are succeeded by small Berries inclosing a small single Seed.

The 12th Sort grows naturally in *Jamaica*; this rises with a shrubby pithy Stalk about 5 Feet high, sending out several Side Branches which have protuberant Joints, and are garnished with Heart-shaped Leaves, 6 Inches long and 5 broad near their Base. They have 5 Veins which arise from the Foot Stalk, the middle one going in a direct Line to the Point, the two Side Veins diverge toward the Edges of the Leaves in the Middle, but approach again at the Top; the Surface of the Leaves is full of small Veins, which form a Sort of Net Work. The Spikes come out from the Side of the Branches opposite to the Leaves, they are slender, and about 5 Inches long, a little bending in the Middle, and are closely set with very small herbaceous Flowers.

The 13th Sort grows naturally at *Campeachy*. This hath many shrubby Stalks, which rise about 10 Feet high, and divide into several crooked Branches toward the Top, which have swelling Joints, and are garnished with oval Spear-shaped Leaves, near 4 Inches long, and 2 and a Half broad, terminating in acute Points; they are smooth, of a lucid green, and have 3 large Veins running longitudinally; the Middle (or Mid-rib) being strait, the two outer diverging toward the Sides in the Middle of the Leaf, but drawn together again at the Point. The Spikes come out from the Side of the Stalks opposite to the Leaves; they are pretty long, slender, and a little incurved. The Flowers and Seeds are like the other Species.

The 14th Sort grows naturally at *Campeachy*; this hath a shrubby Stalk, which rises 10 or 12 Feet high, dividing

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ing toward the Top into a great Number of small Branches, which are hollow, and have protuberant Joints; they are garnished with Spear-shaped, oval, rough Leaves, about 5 Inches long, and 2 Inches and a Half broad; some of them have long, and others very short Foot Stalks; they are of a deep green on their upper Side, but pale on their under, ending in acute Points. The Spikes come out from the Side of the Stalks, opposite to the Leaves; they are long and slender, and are closely set with very small Flowers like the other Species.

The twelve last mentioned Sorts are abiding Plants, which require a warm Stove to preserve them in *England*. They may be propagated by Seeds, if they can be procured fresh from the Countries where the Plants grow naturally; these should be sown upon a good hot Bed in the Spring, and when the Plants come up and are fit to transplant, they should be each put into a small Pot, filled with light fresh Earth, and plunged into a hot Bed of Tanners Bark, shading them every Day from the Sun, till they have taken fresh Root; then they must be treated as other tender exotic Plants admitting fresh Air to them daily, in Proportion to the Warmth of the Season, to prevent their drawing up weak; and when the Nights are cold, the Glasses of the hot Bed, should be covered with Mats to keep them warm. As the Stalks of most of these Plants are tender when young, so they should not have much Wet, which would rot them, and when Water is given to them it must be with Caution, not to beat down the Plants, for when that is done, they seldom rise again.

In Autumn the Plants must be plunged into the Tan Bed of the Bark Stove, and during the Winter they must be sparingly watered; they require the same Warmth as the Coffee Tree. In Summer they require a large Share of fresh Air in hot Weather, but they must be constantly kept in the Stove, for they are too tender to bear the Inclemency of our Weather in Summer.

PISONIA. *Plum. Nov. Gen. 7. Tab. 11. Lin. Gen. Plant. 984. Fingrigo, vulgò.*

The Characters are,

The male Flowers grow upon different Plants from the Fruit. The male Flowers have a small erect Empalement, cut into 5 acute Points. The Flowers are Funnel-shaped the Tube is short, the Brim is expanded, and cut into 5 acute Parts; they have 5 Awl-shaped Stamina, which are longer than the Petal, terminated by obtuse Summits. The female Flowers have Empalements like the male, and the Flowers are of the same Form; they sit upon the Germen, which is situated under the Receptacle, supporting a cylindrical Style longer than the Petal, crowned by 5 oblong spreading Stigmas. The Germen turns to an oval Capsule having 5 Angles and one Cell, containing one smooth, oblong, oval Seed.

We have but one Species at present in *England*, viz.

PISONIA aculeata. *Lin. Sp. Plant. 1026. Prickly Pisonia; called Fingrigo in the West-Indies.* This is the *Pisonia aculeata, fructu glutinoso & racemoso. Plum. Nov. Gen. 7. Prickly Pisonia with a glutinous branching Fruit.*

The Name of this Plant was given by Father Plumier, in Honour of Dr. William Piso, who published a Natural History of *Brazil*. The Name of Fingrigo is what the Inhabitants of *Jamaica* know it by.

The male Plants differ so much in Appearance from the female, that those who have not seen them rise from the same Seeds, would suppose they were different Species, I shall therefore give short Descriptions of each.

The male Plants have Stalks as thick as a Man's Arm, which rise 10 or 12 Feet high; the Bark is of a dark brown Colour, and smooth; these send out many Branches by Pairs opposite, which are much stronger than those of the female, so do not hang about so loose. They are garnished with obverse, oval, stiff Leaves, an Inch and a Half long, and an Inch and a Quarter broad, standing opposite on short Foot Stalks. From the Side of the Branches come out short Cursons or Spurs like those of the Pear Tree, having each 2 Pair of small Leaves at Bottom, and from the Top comes out the Foot Stalk of the Flowers which is slender, about half an Inch long, dividing at the Top into three; each of these sustain a small Corymbus of herbaceous yellow Flowers, each having 5 Stamina standing out beyond the Petal, terminated by obtuse Summits.

The Stalks of the female Plants are not so strong as those of the male, so require Support. These rise 18 or 20 Feet high, sending out slender weak Branches opposite, which are armed with short strong hooked Spines, and garnished with small oval Leaves, about an Inch and three Quarters broad; these stand opposite on the larger Branches, but on the smaller they are alternate and have short Foot Stalks. The Flowers are produced in small Bunches at the End of the Branches, sitting upon the Germen; they are shaped like those of the male, but have no Stamina; in the Center is situated a cylindrical Style, crowned by 5 spreading Stigmas. The Germen turns to a channelled, five-cornered, glutinous Capsule, armed with small crooked Spines, each containing one oblong, oval, smooth Seed.

These Plants are very common in the *Savannas*, and other low Places in the Island of *Jamaica*, as also in several other Islands in the *West-Indies*; where it is very troublesome to whoever passes through the Places of their Growth, fastening themselves by their strong crooked Thorns, to the Clothes of the Persons; and their Seeds being glutinous and burry, also fasten themselves to whatever touches them; so that the Wings of the Ground-doves and other Birds, are often so loaded with the Seeds, as to prevent their flying, by which Means they become an easy Prey.

In *Europe* this Plant is preserved in the Gardens of some curious Persons for Variety; it is propagated by Seeds, which should be sown in Pots filled with light rich Earth, and plunged into a hot Bed of Tanners Bark; and when the Plants come up, they should be transplanted into separate Pots, and plunged into the hot Bed again; where they may remain till *Michaelmas*, when they should be removed into the Stove, and plunged into the Bark Bed, and treated in the Manner directed for several tender Plants of the same Country; observing in hot Weather to give them Plenty of Water, but in Winter they should have it more sparingly. They are too tender to thrive in the open Air of this Country at any Season of the Year; wherefore they should be constantly kept in the St. ve. They retain their Leaves most Part of the Year in *England*.

PISTACIA. Lin. Gen. Plant. 982. *Terebinthus*. Tourn. Inst. R. H. 579. *Lentiscus*. Tourn. Inst. R. H. 580. Turpentine Tree, Pistachia Nut, and Mastick Tree.

The Characters are,

The male and female Flowers grow upon separate Trees; the male Flowers are disposed in loose sparsed Katkins, having small Scales with one Flower; these have small five-pointed Empalements, but no Petals; they have 5 small Stamina, terminated by oval, four-cornered, erect Summits. The female Flowers have small trifid Empalements, but no Petals; they have each a large oval Germen, supporting 3 reflexed Styles; crowned by thick prickly Stigmas. The Germen turns to a dry Berry or Nut, inclosing an oval smooth Seed.

The Species are,

1. PISTACIA foliis impari pinnatis, foliolis subovatis recurvis. Lin. Sp. Plant. 1025. Pistachia with unequal winged Leaves, whose Lobes are somewhat oval and recurved. This is the *Terebinthus Indica Theophrasti pistacia Dioscoridis*. Adv. 413. The Pistachia Tree.

2. PISTACIA foliis subternatis. Hort. Cliff. 456. Pistachia with trifoliate Leaves. This is the *Terebinthus, seu pistacia trifolia*. Tourn. Inst. 580. Three-leaved Turpentine, or Pistachia Tree.

3. PISTACIA foliis pinnatis ternatisque, suborbiculatis. Lin. Sp. Plant. 1025. Pistachia with winged and trifoliate Leaves, which are almost round. This is the *Terebinthus peregrina, fructu majore, pistaciis simili, eduli*. C. B. P. 400. Tourn. Inst. 579. Foreign Turpentine Tree with a large eatable Fruit like Pistachia.

4. PISTACIA foliis impari pinnatis, foliolis ovato-lanceolatis. Hort. Cliff. 456. Pistachia with unequal winged Leaves, whose Lobes are oval and Spear-shaped. This is the *Terebinthus vulgaris*, C. B. P. 400. The common Turpentine Tree.

5. PISTACIA foliis abruptè pinnatis, foliolis lanceolatis. Hort. Cliff. 456. Pistachia with abrupt winged Leaves, and Spear-shaped Lobes. This is the *Lentiscus vulgaris*. C. B. P. 399. Common Mastick Tree.

6. PISTACIA foliis abruptè pinnatis, foliolis lineari lanceolatis. Pistachia with abrupt winged Leaves, and narrow Spear-shaped Lobes. This is the *Lentiscus angustifolia Massiliensis*. H. R. Par. Narrow-leaved Mastick Tree of *Marfeilles*.

7. PISTACIA foliis impari pinnatis, foliolis lanceolato-ovatis acuminatis. Pistachia with unequal winged Leaves, whose Lobes are Spear-shaped, oval, and acute-pointed. This is the *Terebinthus pistacia fructu non eduli*. Plum. Cat. 17. Turpentine Tree with a Fruit like the Pistachia, which is not eatable.

8. PISTACIA foliis pinnatis deciduis, foliolis oblongo-ovatis. Pistachia with winged deciduous Leaves, having oblong oval Lobes. This is the *Terebinthus major, betulæ cortice, fructu triangulari*. Sloan. Hist. Jam. 2. p. 89. Tab. 199. Greater Turpentine Tree, with a Bark like the Birch Tree and a triangular Fruit, commonly called Birch Tree in *Jamaica*.

9. PISTACIA foliis impari pinnatis, foliolis lanceolatis, exterioribus majoribus. Pistachia with unequal winged Leaves, whose Lobes are Spear-shaped, and the outer ones the largest. This is the *Lentiscus vera. ex insula Cbio, cortice & foliis fuscis*. Cat. Hort. Amst. 192. The true Mastick Tree of the Island of *Cbio*, with a brown-coloured Bark and Leaves.

The 1st Sort is the Pistachia Nut Tree, whose Fruit is much better known in *England* than the Tree. This grows naturally in *Arabia*, *Persia*, and *Syria*, from whence the Nuts are annually brought to *Europe*. In those Countries it grows to the Height of 25 or 30 Feet; the Bark of the Stem and old Branches is of a dark russet Colour, but that of the young Branches is of a light brown; these are garnished with winged Leaves, composed sometimes of two, and at others of three Pair of Lobes, terminated by an odd one; these Lobes approach toward an oval Shape, and their Edges turn backward; if these are bruised, they emit an Odour like the Shell of the Nut. Some of these Trees produce male Flowers, others have female, and some, when old, have both on the same Tree. The male Flowers come out from the Side of the Branches, in loose Bunches or Katkins; they are of an herbaceous Colour, having no Petals, but have each five small Stamina, crowned by large four-cornered Summits filled with Farina; when that is discharged, the Flowers fall off. The female Flowers come out in Clusters from the Side of the Branches; these have no Petals, but have each a large oval Germen, supporting three reflexed Styles; these are succeeded by oval Nuts. This Tree flowers in *April*, but the Fruit never ripens in *England*. It is propagated by the Nuts, which should be planted in Pots filled with light Kitchen Garden Earth, and plunged into a moderate hot Bed to bring up the Plants; when these appear, they should have a large Share of Air admitted to them, to prevent their drawing up weak; and by Degrees they must be hardened to bear the open Air, to which they should be exposed the Beginning of *June*, and may remain abroad till Autumn, when they should be placed under a hot Bed Frame to screen them from the Frost in Winter, for while they are young they are too tender to live through the Winter in *England* without Protection, but they should always be exposed to the Air in mild Weather; these Plants shed their Leaves in Autumn, so should not have much Wet in Winter; and in the Spring, before the Plants begin to shoot, they must be transplanted each into a separate small Pot; and if they are plunged in a very moderate hot Bed, it will forward their putting out new Roots; but as soon as they begin to shoot, they must be gradually hardened, and placed abroad again: These Plants may be kept in Pots 3 or 4 Years, till they have got Strength, during which Time they should be sheltered in Winter; and afterward they may be turned out of the Pots, and planted in the full Ground, some against high Walls to a warm Aspect, and others in a sheltered Situation, where they will bear the Cold of our ordinary Winters very well, but in severe Frosts they are often destroyed. The Trees flower and produce Fruit in *England*, but the Summers are not warm enough to ripen the Nuts.

The 2d Sort grows naturally in *Sicily* and the *Levant*, where it is a Tree of middling Size, covered with a rough brown Bark, and dividing into many Branches, garnished with Leaves, which for the most Part have three, but some have four oval Lobes; they stand upon long Foot Stalks, and are of a dark green Colour. The male Flowers grow upon different Trees from the female, and are like those of the former Sort,

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but are of a yellowish green Colour. The female Flowers I have not seen, so can give no Account of them; these are succeeded by Fruit like that of the former, but much smaller. This is propagated by Seeds as the former and the Plants treated in the same Way, but require more Protection in Winter. There were several Plants of this Kind in the *English* Gardens before the Year 1740, which had lived abroad some Years against Walls, but that severe Winter killed them.

The 3d Sort grows in *Italy* and the South of *France*, but is supposed to have been transplanted there from some other Country. This is a Tree of middling Size, covered with a light gray Bark, sending out many Side Branches, garnished with Leaves which have sometimes five, and at others but three roundish Lobes; these stand upon pretty long Foot Stalks, and are of a light green Colour. The male Flowers grow upon separate Trees from the Fruit, as in the other Sorts; the Fruit is small, but eatable. This is propagated by the Nuts in the same Way as the first, and the Plants are equally hardy.

The 4th Sort grows naturally in *Barbary*, and in *Spain* and *Italy*. This is a Tree of middling Size, covered with a broad Bark, and dividing into many Branches, whose Bark is very smooth while young; they are garnished with winged Leaves, composed of 3 or 4 Pair of oval Spear-shaped Lobes, terminated by an odd one. The Flowers are male and female on different Trees, as the former: The male Flowers have purplish Stamina, they appear in *April*, but I have not seen any of the female Trees in flower. This is propagated by Seeds, but unless they are sown in Autumn soon after they are ripe, they seldom grow the first Year, but remain in the Ground a whole Year; and unless the Seeds are taken from such Trees as grow near a Male, they will not grow, as I have several Times experienced.

The Plants of this Sort may be treated in the same Manner as the first, and are as hardy. There is a Tree of this Sort now growing in the Gardens of the Bishop of *London* at *Fulham*, against a Wall, which was planted there above forty Years ago, and has endured the Winters without Cover; and some Trees of this Kind which were planted in the open Air, in the Garden of his Grace the Duke of *Richmond*, at *Goodwood* in *Suffex*, had survived several Winters without any Protection. From these Trees the common Turpentine of the Shops was formerly taken, but there is little of it now imported, but that from some of the Cone-bearing Trees is generally substituted for it.

The 5th Sort is the common Mastick Tree, which is better known in the Gardens by its *Latin* Title of *Lenitiscus*. This grows naturally in *Spain*, *Portugal*, and *Italy*, and being ever-green, the Plants have been preserved in the *English* Gardens, to adorn the Green-house in Winter. This in its native Countries rises to the Height of 18 or 20 Feet, covered with a gray Bark, sending out many Branches, which have a reddish brown Bark, and are garnished with winged Leaves composed of 3 or 4 Pair of small Spear-shaped Lobes, without an odd one at the End. The Mid-rib which sustains the Lobes, has 2 narrow Borders or Wings, running from Lobe to Lobe; these Lobes are of a lu-

cid green on their upper Side, but pale on their under. The male Flowers come out in loose Clusters from the Sides of the Branches, they are of an herbaceous Colour, appearing in *May*, and soon fall off. These are generally upon different Plants from the Fruit, which also grows in Clusters, and are small Berries of a black Colour when ripe.

The Plants of this Sort are generally propagated by laying down their young Branches, which, if properly managed, will put out Roots in one Year, and may then be cut off from the old Plants, and each transplanted into separate small Pots. These must be sheltered in Winter, and in Summer placed abroad in a sheltered Situation, and treated as other hardy Kinds of Green-house Plants. It may also be propagated by Seeds as the Turpentine Tree, but if the Seeds are not taken from Trees growing in the Neighbourhood of the male, they will not grow; and if they are kept out of the Ground till Spring, the Plants rarely appear till the Spring following. When these Plants have obtained Strength, some of them may be turned out of the Pots, and planted against warm Walls, where, if their Branches are trained against the Walls, they will endure the Cold of our ordinary Winters very well, and with a little Shelter in severe Winters may be preserved.

The 6th Sort grows naturally about *Marseilles*, and other Places in the South of *France*, where it rises to the Height of the former, from which it differs in having one or two Pair of Lobes more on each Leaf, and the Lobes are much narrower and of a paler Colour. This Difference holds in the Plants which are propagated by Seeds, so may be pronounced a distinct Species. It is propagated as the former Sort, and is equally hardy.

The 7th Sort grows naturally in many of the Islands in the *West-Indies*, where it rises to a middling Stature, dividing into many Branches, covered with a purplish Bark, and garnished with winged Leaves, composed of 2 or 3 Pair of Spear-shaped, oval, acute-pointed Lobes, terminated by an odd one; these are an Inch and three Quarters long, and near an Inch broad, running out in acute Points; they are very thin and tender, and have long Foot Stalks. The male Flowers come out at the End of the Branches, they are disposed in a single Bunch about 3 Inches long; are of a purplish Colour, and have yellow Summits. The Fruit grows on separate Trees from the male Flowers, they are shaped like the Pistachia Nuts, but are smaller and not eatable. This was sent me from *Antigua*.

The 8th Sort grows naturally in *Jamaica*, and in most of the Islands in the *West-Indies*, where it rises to the Height of 30 or 40 Feet, covered with loose brown Bark, which falls off in large Pieces; the Stems are large, and divide into many Branches toward the Top, which are crooked and unsightly; these are garnished with winged Leaves, composed of 5 or 6 Pair of oblong oval, smooth Lobes, about 4 Inches long and 2 broad, terminated by an odd one. The Flowers come out at the End of the Branches, in long loose Bunches of a yellowish Colour; these grow on different Trees, or different Parts of the same Tree from the Fruit, which also hangs in long Bunches, and is about the Size of a middling Pea, having a dark Skin covering a Nut about the Size and Colour of a common Cherry Stone.

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These two Trees are tender, so will not thrive in this Country unless they are kept in a warm Stove. They are propagated by Seeds, which must be taken from such Trees as grow in the Neighbourhood of the Males, otherwise they will not grow, as I have too often found true. These should be sown in Pots filled with light Earth, and plunged into a good hot Bed of Tanners Bark, and when the Plants are come up fit to remove, they should be each planted in a small Pot, and plunged into a fresh hot Bed, treating them as other tender Plants from the same Countries; in Autumn they should be removed into the Stove, plunging the Pots into the Tan Bed, and during the Winter they must have but little Water, especially if they cast their Leaves, which is generally the Case after the first Winter; for the young Plants generally retain their Leaves the whole Year, but afterward they are destitute of Leaves for 2 Months, in the latter Part of Winter. These Plants should constantly remain in the Stove, but in warm Weather they must have a large Share of Air.

The 9th Sort is the true Mastick Tree of the *Levant*, from which the Mastick is gathered. This has been confounded with the common *Lentiscus*, by most Botanical Writers; and *Tournefort*, who was on the Spot where the Mastick is collected, has not distinguished the Species; though he says, the Leaves of the Trees in the *Levant*, are larger than those of the common Sort, but takes no Notice of their being unequally winged. The Seeds of this Tree were sent me by *Monf. Richard*, Gardener to the King of France at *Versailles*, who received them from the Island of *Cbio* in the *Levant*, which succeeded in the *Chelsea* Garden; the Bark of the Trees is brown, the Leaves are composed of 2 or 3 Pair of Spear-shaped Lobes, terminated by an odd one; the outer Lobes are the largest, the others gradually diminish, the innermost being the least; these turn of a brownish Colour toward Autumn, when the Plants are exposed to the open Air; but if they are under Glasses, they keep green. The Leaves continue all the Year, but are not so thick as those of the common Sort, nor are the Plants so hardy. It is propagated by Seeds as the common *Lentiscus*, but the Plants are less hardy, so should be kept in a gentle Temperature of Warmth in Winter, and require a warm sheltered Situation in Summer. When they have obtained Strength, they may be kept in a warm Green-house in Winter, but should have little Water during that Season.

PISUM. *Tourn. Inst. R. H.* 394. *Tab.* 215. *Lin. Gen. Plant.* 779. Pea; in French, *Pois*.

The Characters are,

The Flower hath a one leaved permanent Empalement cut into 5 Points, the 2 upper being broadest; it hath 4 Petals, and is of the Butterfly Kind. The Standard is broad, Heart-shaped, reflexed, and indented, ending in a Point. The 2 Wings are shorter, roundish, and close together; the Keel is compressed, Half-moon-shaped, and shorter than the Wings. It hath 10 Stamina in 2 Bodies, the upper single one is plain and Awl-shaped, the other 9 are cylindrical below the Middle, Awl-shaped above and cut, these are joined together; they are terminated by roundish Summits. It has an oblong compressed Germen, with a triangular rising Style, crowned by a hairy oblong Stigma. The Germen becomes a large long taper Pod, terminated by a

sharp rising Point, opening with 2 Valves having one Row of roundish Seeds.

The Species are,

1. PISUM *stipulis infernè rotundatis crenatis, petiolis teretibus, pedunculis multifloris.* *Hort. Up.* Pea whose lower Stipulæ are roundish and indented, with taper Foot Stalks, and many Flowers on a Foot Stalk. This is the *Pisum hortense majus, flore fructuque albo.* C. B. P. Greater Garden Pea, with a white Flower and Fruit.

2. PISUM *caule erecto ramoso, foliis bijugatis, foliolis rotundioribus.* Pea with an erect branching Stalk, and Leaves having two Pair of round Lobes. This is the *Pisum humile, caule firmo.* *Tourn. Inst. R. H.* 394. Dwarf Pea with a firm Stalk.

3. PISUM *stipulis quadrifidis acutis, pedunculis multifloris terminalibus.* Pea with four-pointed acute Stipulæ, and Foot Stalks bearing many Flowers, which terminate the Stalks. This is the *Pisum umbellatum.* C. B. P. 342. The Rose or Crown Pea.

4. PISUM *petiolis supra planiusculis, caule angulato, stipulis sagittatis, pedunculis multifloris.* *Flor. Suec.* 608. Pea with Foot Stalks which are plain on their upper Side, an angular Stalk, Arrow-pointed Stipulæ, and Foot Stalks bearing many Flowers.

5. PISUM *caule angulato procumbente, foliolis inferioribus lanceolatis acutè dentatis, summis sagittatis.* Pea with an angular trailing Stalk, whose lower Leaves are Spear-shaped and sharply indented, and those at the Top Arrow-pointed, commonly called Cope Horn Pea.

6. PISUM *petiolis decurrentibus membranaceis, diphyllis, pedunculis unifloris.* *Hort. Cliff.* 370. Pea with membranaceous running Foot Stalks having two Leaves, and one Flower upon a Foot Stalk. This is the *Ocbrus folio integro capreolos emittente.* C. B. P. 343. Winged Pea with an entire Leaf sending out Tendrils.

There are a great Variety of Garden Peas now cultivated in England, which are distinguished by the Gardeners and Seedsmen, and have their different Titles; but as great Part of these are only seminal Variations, and if not very carefully managed, by taking away all those Plants which have a Tendency to alter, before the Seeds are formed, they will degenerate into their original State, so that all those Persons who are curious in the Choice of their Seeds, look carefully over those which they design for Seeds at the Time when they begin to flower, and draw out all the Plants which they dislike from the other. This is what they call Roguing their Peas, meaning hereby, the taking out all the bad Plants from the good, that the Farina of the former may not impregnate the latter; to prevent which, they always do it before the Flowers open; by thus diligently drawing out the bad, and marking those which come earliest to flower, they have greatly improved their Peas of late Years, and are constantly endeavouring to get forwarder Varieties; so that it would be to little Purpose in this Place, to attempt giving a particular Account of them now cultivated; therefore I shall only mention their Titles by which they are commonly known, placing them according to their Time of coming to the Table, or gathering for Use.

The Golden Hotspur. Nonpareil.

The Charleton. Sugar Dwarf.

The Reading Hotspur. Sickle Pea.

Masters's

Masters's Hotspur. Marrowfat.
 Essex Hotspur. Rose, or Crown Pea.
 The Dwarf Pea. Rouncival Pea.
 The Sugar Pea. Gray Pea.
 Spanish Morotto. Pig Pea, with some others.

The English Sea Pea is found wild upon the Shore in *Sussex*, and several other Counties in *England*. This was first taken Notice of in the Year 1555, between *Orford* and *Aldborough*, where it grew upon the Heath, where nothing, no not Grass, was ever seen to grow; and the poor People being in Distress, by Reason of the Dearth of that Year, gathered large Quantities of these Peas, and so preserved themselves and Families. This is mentioned by *Stow* in his *Chronicle*, and *Camden* in his *Britannia*: But they were both mistaken, in imagining that they were Peas cast on Shore by a Shipwreck, seeing they grow in divers other Parts of *England*, and are undoubtedly a different Species from the common Pea.

The 5th Sort hath a perennial Root, which continues some Years. This was brought from *Cape Horn* by Lord *Anson's* Cook, when he passed that *Cape*, where these Peas were a great Relief to the Sailors. It is kept here as a Curiosity, but the Peas are not so good for eating as the worst Sort now cultivated in *England*; it is a low trailing Plant, the Leaves have two Lobes on each Foot Stalk; those below are Spear-shaped, and sharply indented on their Edges, but the upper Leaves are small and Arrow-pointed. The Flowers are blue, each Foot Stalk sustaining 4 or 5 Flowers; the Pods are taper, near 3 Inches long, and the Seeds are round, about the Size of Tares.

The 6th Sort is annual; this grows naturally amongst the Corn in *Sicily* and some Parts of *Italy*, but is here preserved in Botanick Gardens for Variety. It hath an angular Stalk rising near 3 Feet high; the Leaves stand upon winged or awning Foot Stalks, each sustaining two oblong Lobes. The Flowers are of a pale yellow Colour, and shaped like those of the other Sorts of Pea, but are small, each Foot Stalk sustaining one Flower; these are succeeded by Pods about 2 Inches long, containing 5 or 6 roundish Seeds, which are a little compressed on their Sides. These are by some Persons eaten green, but unless they are gathered very young they are coarse, and at best not so good as the common Pea. It may be sown and managed in the same Way as the Garden Pea.

I shall now proceed to set down the Method of cultivating the several Sorts of Garden Peas, so as to continue them throughout the Season.

It is a common Practice with the Gardeners near *London*, to raise Peas upon hot Beds, to have them very early in the Spring; in order to which, they sow their Peas upon warm Borders under Walls or Hedges, about the Middle of *October*; and when the Plants come up, they draw the Earth up gently to their Stems with a Hoe, the better to protect them from Frost. In these Places they let them remain until the latter End of *January*, or the Beginning of *February*, observing to earth them up from Time to Time, as the Plants advance in Height (for the reasons before laid down); also to cover them in very hard Frost with Peas Haulm, Straw, or some other light Covering, to preserve them from being

destroyed; then, at the Time before-mentioned, they make a hot Bed (in Proportion to the Quantity of Peas intended) which must be made of good hot Dung well prepared and properly mixed together, that the Heat may not be too great. The Dung should be laid about 2 Feet thick, or somewhat more, according as the Beds are made earlier or later in the Season; when the Dung is equally levelled, then the Earth (which should be light and fresh, but not over-rich) must be laid on about 6 or 8 Inches thick, laying it equally all over the Bed. This being done, the Frames (which should be 2 Feet high on the back Side, and about 14 Inches in Front) must be put on, and covered with Glasses; after which it should remain 3 or 4 Days, to let the Steam of the Bed pass off, before you put the Plants therein; observing every Day to raise the Glasses either with Bricks or Stones, to give Vent for the rising Steam to pass off; then when you find the Bed of a fine moderate Temperature for Heat, you should, with a Trowel or some other Instrument, take up the Plants as carefully as possible, to preserve the Earth to the Roots, and plant them into the hot Bed in Rows, about 2 Feet asunder; and the Plants should be set about an Inch distant from each other in the Rows, observing to water and shade them until they have taken Root; after which be careful to give them Air, at all Times when the Season is favourable, otherwise they will draw up very weak, and be subject to grow mouldy and decay. You should also draw the Earth up to the Shanks of the Plants, as they advance in Height, and keep them always clear from Weeds. The Water they should have, must be given them sparingly, for if they are too much watered, it will cause them to grow too rank, and sometimes rot off the Plants at their Shanks, just above Ground. When the Weather is very hot, you should cover the Glasses with Mats in the Heat of the Day, to screen them from the Violence of the Sun, which is then too great for them, causing their Leaves to flag, and their Blossoms to fall off without producing Pods, as will also keeping the Glasses too close at that Season. But when the Plants begin to fruit, they should be watered oftener, and in greater Plenty than before; for by that Time the Plants will have nearly done growing, and the often refreshing them will occasion their producing a greater Plenty of Fruit.

The Sort of Pea which is generally used for this Purpose is the Dwarf, for all the other Sorts ramble too much to be kept in Frames; the Reason for sowing them in the common Ground, and afterwards transplanting them on a hot Bed, is also to check their Growth, and cause them to bear in less Compass; for if the Seeds were sown upon a hot Bed, and the Plants continued thereon, they would produce such luxuriant Plants as are not to be contained in the Frames, and would bear but little Fruit.

The next Sort of Pea, which is sown to succeed those on the hot Bed, is the Hotspur, of which there are reckoned three or four Sorts; as the Golden Hotspur, the *Charlton* Hotspur, the Masters's Hotspur, the *Reading* Hotspur, and some others; which are very little differing from each other, except in their early bearing, for which the Golden and *Charlton* Hotspurs are chiefly preferred; though if either of these Sorts are cultivated

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in the same Place for three or four Years, they are apt to degenerate, and be later in fruiting; for which Reason, most curious Persons procure their Seeds annually from some distant Place; and in the Choice of these Seeds, if they could be obtained from a colder Situation and a poorer Soil, than that in which they are to be sown, it will be much better than on the contrary, and they will come earlier in the Spring.

These must also be sown on warm Borders, towards the latter End of *October*; and when the Plants are come up, you should draw the Earth up to their Shanks in the Manner before directed; which should be repeated as the Plants advance in Height (always observing to do it when the Ground is dry) which will greatly protect the Stems of the Plants against Frost; and if the Winter should prove very severe, it will be of great Service to the Plants to cover them with Peas Haulm, or some other light Covering; which should be constantly taken off in mild Weather, and only suffered to remain on during the Continuance of the Frost; for if they are kept too close, they will be drawn very weak and tender, and thereby be liable to be destroyed with the least Inclemency of the Season.

In the Spring you must carefully clear them from Weeds, and draw some fresh Earth up to their Stems; but do not raise it too high to the Plants, lest by burying their Leaves you should rot their Stems, as is sometimes the Case, especially in wet Seasons. You should also observe to keep them clear from Vermin, which if permitted to remain amongst the Plants, will increase so plentifully, as to devour the greatest Part of them. The chief of the Vermin which infest Peas, are the Slugs, which lie all the Day in the small Hollows of the Earth, near the Stems of the Plants, and in the Night Time come out, and make terrible Destruction of the Peas; and these chiefly abound in wet Soils, or where a Garden is neglected, and over-run with Weeds; therefore you should make the Ground clear every Way round the Peas to destroy their Harbours, and afterwards in a fine mild Morning very early, when these Vermin are got abroad from their Holes, you should slack a Quantity of Lime, which should be sown hot over the Ground pretty thick, which will destroy the Vermin, where-ever it happens to fall upon them, but will do very little Injury to the Peas, provided it be not scattered too thick upon them. This is the best Method I could ever find to destroy these troublesome Vermin.

If this Crop of Peas succeeds, it will immediately follow those on the hot Bed; but for fear this should miscarry, it will be proper to sow two more Crops at about a Fortnight's Distance from each other, so that there may be the more Chances to succeed. This will be sufficient until the Spring of the Year, when you may sow three more Crops of these Peas; one toward the Beginning of *January*, the other a Fortnight after, and the third at the End of *January*. These two late Sowings will be sufficient to continue the early Sort of Peas through the first Season, and after this it will be proper to have some of the large Sort of Peas to succeed them for the Use of the Family; in order to which you should sow some of the *Spanish Morotto*, which is a great Bearer, and a hardy Sort of Pea, about the Middle of *February*, upon a clear open Spot of Ground.

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These must be sown in Rows about 3 Feet asunder, and the Peas should be dropped in the Drills about an Inch Distance, covering them about 2 Inches deep with Earth, being very careful that none of them lie uncovered, which will draw the Mice, Pigeons, or Rooks, to attack the whole Spot; and it often happens by this Neglect, that a whole Plantation is devoured by these Creatures; whereas, when there are none of the Peas left in Sight, they do not so easily find them out.

About a Fortnight after this you should sow another Spot, either of this Sort, or any other large Sort of Pea, to succeed those, and then continue to repeat sowing once a Fortnight, till the Middle or latter End of *May*, some of these Kinds, only observing to allow the Marrowfats, and other very large Sorts of Peas, at least three Feet and a Half, or four Feet between Row and Row; and the Rose Pea should be allowed at least eight or ten Inches Distance Plant from Plant in the Rows, for these grow very large, and if they have not Room allowed them, they will spoil each other by drawing up very tall, and will produce no Fruit.

When these Plants come up, the Earth should be drawn up to their Shanks (as was before directed), and the Ground kept entirely clear from Weeds; and when the Plants are grown 8 or 10 Inches high, you should stick some rough Boughs, or Brushwood, into the Ground close to the Peas for them to ramp upon, which will support them from trailing on the Ground, which is very apt to rot the large-growing Sorts of Peas, especially in wet Seasons; besides, by thus supporting them, the Air can freely pass between them, which will preserve the Blossoms from falling off before their Time, and occasion them to bear much better than if permitted to lie on the Ground, and there will be Room to pass between the Rows to gather the Peas when they are ripe.

The Dwarf Sorts of Peas may be sown much closer together than those before-mentioned, for these seldom rise above a Foot high, and rarely spread above half a Foot in Width, so that these need not have more Room than two Feet Row from Row, and not above an Inch asunder in the Row. These will produce a good Quantity of Peas, provided the Season be not over-dry, but they seldom continue long in bearing, so that they are not so proper to sow for the main Crop, when a Quantity of Peas is expected for the Table, their chief Excellency being for hot Beds, where they will produce a greater Quantity of Peas (provided they are well managed) than if exposed to the open Air, where the Heat of the Sun soon dries them up.

The Sickle Pea is much more common in *Holland* than in *England*, it being the Sort mostly cultivated in that Country; but in *England* they are only propagated by curious Gentlemen for their own Table, and are rarely brought into the Markets. This Sort the Birds are very fond of, and if they are not prevented, many Times destroy the whole Crop. This should be planted in Rows about two Feet and a Half asunder, and be managed as hath been directed for the other Sorts.

Although I have directed the sowing of the large Sorts of Peas for the great Crop, yet these are not so sweet as the early Hotspur Peas; therefore it will also be proper to continue a Succession of those Sorts through the

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the Season, in small Quantities, to supply the best Table, which may be done by sowing some every Week or ten Days; but all those, which are sown late in the Season, should have a strong moist Soil, for in hot light Land they will burn up and come to nothing.

The large growing Sorts may be cultivated for the common Use of the Family, because these will produce in greater Quantities than the other and will endure the Drought better, but the early Kinds are by far the sweeter tasted Peas.

The best of all the large Kinds is the Marrowfat; which, if gathered young, is a well tasted Pea, and this will continue good through the Month of *August*, if planted on a strong Soil.

The gray and other large Winter Peas are seldom cultivated in Gardens, because they require a great deal of Room, but are usually sown in Fields in most Parts of *England*. The best Time for sowing these is about the Beginning of *March*, when the Weather is pretty dry, for if they are put into the Ground in a very wet Season they are apt to rot, especially if the Ground be cold; these should be allowed at least three Feet Distance Row from Row, and must be sown very thin in the Rows; for if they are sown too thick, the Haulm will spread so as to fill the Ground, and ramble over each other, which will cause the Plants to rot, and prevent their bearing.

The common white Pea will do best on light sandy Land, or on a rich loose Soil. The usual Method of sowing these Peas is with a broad Cast, and so harrow them in; but it is a much better Way to sow them in Drills about two Feet asunder, for half the Quantity of Seed will do for an Acre, and being set regularly, the Ground may be stirred with a Hoe to destroy the Weeds, and earth up the Peas which will greatly improve them, and the Peas may be much easier cut in Autumn, when they are ripe. The usual Time for sowing these Peas is about the latter End of *March*, or the Beginning of *April*, on warm Land, but on cold Ground they should be sown a Fortnight or three Weeks later. In the common Way of sowing, they allow three Bushels or more to an Acre, but if they are drilled, one Bushel and a Half will be full enough.

The Green and Maple Rouncivals require a stronger Soil than the White, and should be sown a little later in the Spring; also the Drills should be made at a greater Distance from each other, for as these are apt to grow rank, especially in a wet Season, they should be set in Rows two Feet and a Half, or three Feet asunder; and the Ground between the Rows should be stirred two or three Times with a Hoe, which will not only destroy the Weeds, but by earthing up the Peas, will greatly improve them, and also render the Ground better to receive whatever Crop is put on it the following Season.

The gray Peas thrive best on a strong clayey Land; these are commonly sown under Furrow, but by this Method they are always too thick, and do not come up regular; therefore all these rank-growing Plants should be sown in Drills, where the Seeds will be more equally scattered, and lodged at the same Depth in the Ground; whereas in the common Way some of the Seeds lie twice as deep as others, and are not scattered at equal Distances. These may be sown toward the End of *Fe-*

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bruary, as they are much hardier than either of the former Sorts, but the Culture for these should be the same.

The best Method to sow these Peas is to draw a Drill with a Hoe by a Line about two Inches deep, and then scatter the Seeds therein; after which with a Rake you may draw the Earth over them, whereby they will be equally covered, and this is a very quick Method for Gardens; but where they are sown in Fields, they commonly make a shallow Furrow with the Plough, and scatter the Seeds therein, and then with a Harrow they cover them over again. After this, the great Trouble is to keep them clear from Weeds, and draw the Earth up to the Plants; this, in such Countries where Labour is dear, is a great Expence to do it by the Hand with Hoe; but this may be easily effected with a Hoe, which may be drawn through between the Rows, which will entirely eradicate the Weeds, and by stirring the Soil, render it mellow, and greatly promote the Growth of the Plants.

When any of these Sorts are intended for Seed, there should be as many Rows of them left ungathered, as may be thought necessary to furnish a sufficient Quantity of Seed, and when the Peas are in flower, they should be carefully looked over to draw out all those Plants which are not of the right Sort; for there will always be some rogues Plants (as the Gardeners term them) in every Sort, which, if left to mix, will degenerate the Kind. These must remain until their Pods are changed brown, and begin to split, when you should immediately gather them up, together with the Haulm; and if you have not Room to stack them till Winter, you may thresh them out as soon as they are dry, and put them up in Sacks for Use; but you must be very careful not to let them remain too long abroad after they are ripe; for if Wet should happen, it would rot them, and Heat, after a Shower of Rain, would cause their Pods to burst, and cast forth their Seeds, so that the greatest Part of them would be lost; but, as I said before, it is not advisable to continue sowing the same Seed longer than two Years for the Reasons there laid down, but rather to exchange their Seeds every Year, or every two Years at least, whereby you may always expect to have them prove right.

PISUM CORDATUM. See *Cardiospermum*.

PITTONIA. See *Tournefortia*.

PLANTAGO. *Tourn. Infl. R. H. 126. Tab. 48. Lin. Gen. Plant. 133.* Plantain. To this Genus Dr. *Linnaeus* has joined the *Coronopus* and *Psyllium* of *Tournefort*. The first of these is called *Harthorn*, the latter *Fleawort*. Of these there are several distinct Species, and some Varieties, but as they are rarely cultivated in Gardens, I shall not enumerate them all here, and shall only mention such of them as grow naturally in *England*. Of the Plantain there are the following Sorts; the common broad-leaved Plantain, called *Waybread*; the great hoary Plantain or *Lambs-tongue*; the narrow-leaved Plantain or *Ribwort*, and the following Varieties have also been found in *England*, which are accidental; the *Befom* Plantain, and *Rose* Plantain. The Plantains grow naturally in Pastures in most Parts of *England*, and are frequently very troublesome Weeds. The common Plantain and *Ribwort* Plantain are both used in Medicine, and are so well known as to need no Description.

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Of the *Coronopus* or Buckhorn Plantain there are two Varieties growing in *England*, viz. the common Buckhorn which grows plentifully on Heaths every where, and the narrow-leaved *Welsb* Sort which is found upon many of the *Welsb* Mountains. The first of these was formerly cultivated as a Sallet Herb in Gardens, but has been long banished from thence for its rank disagreeable Flavour; it is sometimes used in Medicine. There has been one Species of *Pfyllium* or Flea-wort found growing naturally in *England*, which is the Sort used in Medicine, which was in the Earth thrown out of the Bottom of the Canals which were dug for the *Chelsea* Water Works, where it grew in great Plenty. The Seeds of this must have been buried there some Ages, for no Person remembers any of the Plants growing in that neighbourhood before. The Seeds of this are sometimes used, which are imported from the South of *France*.

There are several Varieties of all these three Sorts, which are sometimes preserved in Botanick Gardens, but having no Beauty, they are not admitted into any other, so I shall pass them over here, as being Weeds where ever they are permitted to seed.

PLANTAIN-TREE. See *Musa*.

PLANTING. Although the Method of planting the various Sorts of Trees is fully set down under the several Articles, where each Kind is mentioned; yet it may not be amiss to say something in general upon that Head in this Place, which shall be set down as briefly as possible. And,

First, The first Thing in the planting of Trees is to prepare the Ground (according to the different Sorts of Trees you intend to plant), before the Trees are taken out of the Earth; for you should suffer them to remain as little Time out of the Ground as possible.

In taking up the Trees carefully dig away the Earth round their Roots, so as to come at their several Parts to cut them off; for if they are torn out of the Ground without Care, the Roots will be broken and bruised very much to the great Injury of the Trees. When you have taken them up, the next Thing is to prepare them for planting; in doing of which there are two Things to be principally regarded; the one is to prepare the Roots, and the other, to prune their Heads in such a Manner as may be most serviceable in promoting the future Growth of the Trees.

And first as to the Roots; all the small Fibres are to be cut off as near to the Place from whence they are produced as may be (excepting such Trees as are to be replanted immediately after they are taken up); otherwise the Air will turn all the small Roots and Fibres black, which, if permitted to remain on when the Tree is planted, will grow mouldy, and decay, and thereby greatly injure the new Fibres which are produced, so that many Times the Trees miscarry for Want of duly observing this. After the Fibres are cut off, you should prune off all the bruised or broken Roots smooth, otherwise they are apt to rot, and distemper the Trees; you should also cut out all irregular Roots which cross each other, and all downright Roots (especially in Fruit Trees) must be cut off; so that when the Roots are regularly pruned, they may in some Measure resemble the Fingers of a Hand when spread open; then you should

shorten the larger Roots in Proportion to the Age and Strength of the Tree, as also the particular Sorts of Trees are to be considered; for the Walnut, Mulberry, and some other tender-rooted Kinds should not be pruned so close, as the more hardy Sorts of Fruit or Forest Trees, which in young Fruit Trees, such as Pears, Apples, Plums, Peaches, &c. that are one Year old from budding or grafting, may be left about eight or nine Inches long; but in older Trees they must be left of a much greater Length; but this is to be understood of the larger Roots only, for the small ones must be cut quite out, or pruned very short. Their extreme Parts, which are generally very weak, commonly decay after moving, so that it is the better Way entirely to displace them.

The next Thing is the pruning their Heads, which must be differently performed in different Trees, and the Design of the Trees must also be considered; for if they are Fruit Trees, and intended for Walls or Espaliers, it is the better Way to plant them with the greatest Part of their Heads, which should remain on until the Spring, just before the Trees begin to shoot; when they must be cut down to five or six Eyes (as is fully set down in the several Articles of the various Kinds of Fruit), being very careful, in doing this not to disturb the new Roots.

But if the Trees are designed for Standards, you should prune off all the small Branches close to the Places where they are produced; as also irregular Branches which cross each other, and by their Motion, when agitated by the Wind, rub and bruise their Bark, so as to occasion many Times great Wounds in those Places; besides, it makes a disagreeable Appearance to the Sight, and adds to the Closeness of its Head, which should be always avoided in Fruit Trees, whose Branches should be preserved as far distant from each other, as they are usually produced when in a regular Way of Growth (which is in all Sorts of Trees proportionable to the Size of their Leaves, and Magnitude of their Fruit); for when their Heads are very thick, which is often occasioned by the unskilful shortening their Branches, the Sun and Air cannot freely pass between the Leaves, so that the Fruit must be small and ill-tasted. After having displaced these Branches, also cut off all such Parts of Branches, as have by any Accident been broken or wounded; for these will remain a disagreeable Sight, and often occasion a Disease in the Tree. But you should by no means cut off the main leading Shoots, as is by too many practised, for those are necessary to attract the Sap from the Root, and thereby to promote the Growth of the Tree; for from several Experiments which I made the Winter 1729, by cutting off the Branches of several Sorts of Trees, and putting them into Phials filled with Water, whose Tops were closely covered to prevent the evaporation of the Water, I found, that those Shoots, whose leading Buds were preserved did attract the Moisture in much greater Quantities than those Shoots, whose Tops were cut off; and from several Experiments made by the Rev. Dr. *Hales*, we find that great Quantities of Moisture are imbibed at Wounds, where Branches are cut off; so that by thus shortening the Branches, the Wet, which falls during the Winter Season is plentifully imbibed, and for Want of Leaves

to perspire it off, mixes with the Sap of the Trees, and thereby distending the Vessels, destroys their contracting Force, which many Times kills the Tree, or at least weakens it so much, as not to be recovered again for some Years, as I have several Times observed.

But being willing to try the Experiment in the Month of *October* 1733, I made Choice of two Standard Almond Trees of equal Strength and Age; these I took up as carefully as possible, and having prepared their Roots as before directed, I pruned their Heads in the following Manner, *viz.* from one of them I only cut off the small Branches, and such as were bruised or broken, but preserved all the strong ones entire; of the other, I shortened all the strong Branches, and pruned off the weak and broken Shoots, as is the common Practice. These two Trees I planted in the same Soil, and to the same Situation, gave them both equal Attendance, and managed them both as nearly alike as possible; yet in the Spring, when these Trees began to shoot, that, whose Branches were entirely preserved, came out early, continued to shoot stronger, and is at present much larger, and in better Health than the other. And since this I have made several other Experiments of the like Nature, which have constantly succeeded in the same Manner, from whence it is reasonable to conclude, that shortening the Branches is a great Injury to all new-planted Trees, especially to Cherries and Horse Chestnuts, which are frequently killed by shortning their Branches when they are removed.

Having thus prepared the Trees for planting, we now proceed to placing them in the Ground, but before this, I would advise, if the Trees have been long out of the Ground, so that the Roots are dried, to place them in Water eight or ten Hours before they are planted, observing to put them in such Manner, that their Heads may remain erect, and their Roots only immersed therein, which will swell the dried Vessels of the Roots, and prepare them to imbibe Nourishment from the Earth. In fixing them great Regard should be had to the Nature of the Soil, which if cold and moist, the Trees should be planted very shallow; as also, if it be a hard Rock or Gravel, it will be much the better Way to raise a Hill of Earth where each Tree is to be planted, than to dig into the Rock or Gravel, and fill it up with Earth (as is too often practised), whereby the Trees are planted, as it were in a Tub, there being but little Room for their Roots to extend; so that after two or three Years Growth, when their Roots have extended to the Sides of the Hole, they are stopped by the Rock or Gravel, can get no farther, and the Trees will decline, and in a few Years die; besides, these Holes detain the Moisture so, that the Fibres of the Plants are often rotted thereby. But when they are raised above the Surface of the Ground, their Roots will extend, and find Nourishment, though the Earth upon the Rock or Gravel be not three Inches thick, as may be frequently observed, where Trees are growing upon such Soils.

The next Thing to be observed is to place the Tree in the Hole in such Manner, that the Roots may be about the same Depth in the Ground, as they were growing before they were taken up; then break the Earth fine with a Spade, and scatter it into the Hole,

so that it may fall in between every Root, that there may be no Hollownes in the Earth (but you should by no means sift or screen the Mould, for Reasons given in some other Places; then having filled in the Earth, you should gently tread it close with your Feet, but do not make it too hard, which is a very great Fault, especially if the Ground is strong or wet.

Having thus planted the Trees, you should provide a Parcel of Stakes which should be driven down by the Sides of the Trees, and fastened thereto to support them from being blown down or displaced by the Wind, and then lay some Mulch upon the Surface of the Ground, about their Roots, to prevent the Earth from drying.

This is to be understood of Standard Trees which cast their Leaves; for such as are planted against Walls should have their Branches fastened to the Wall to prevent the Trees being displaced by the Wind, and there is no Difference in their Management, but only to preserve their Heads entire, and to place their Roots about five Inches from the Wall, inclining their Heads thereto; and the Spring following, just before they shoot, their Heads should be cut down to five or six Buds, as is fully directed under the several Articles of the different Kinds of Fruit.

As to watering all new planted Trees, I should advise it to be done with great Moderation, nothing being more injurious to them than over-watering. Examples enough of this Kind may have been seen in many Parts of *England*, where there has been Plantations made, which have been over-watered, whereby the greatest Part have failed, or those, which have survived, have made little Progress, occasioned by the Abundance of Water given to them, whereby the Fibres were rotted off as soon as produced. And how can any Person imagine that a Tree should thrive, when the Ground, in which it is planted, is continually floated with Water? for by an Experiment made by the Rev. Dr. *Hales*, in placing the Roots of a Dwarf Pear Tree in Water, the Quantity of Moisture imbibed decreased very much daily, because the Sap Vessels of the Roots, like those of the cut-off Boughs in the same Experiment, were so saturated and clogged with Moisture, by standing in Water, that more of it could not be drawn up. And this Experiment was tried upon a Tree which was full of Leaves, and thereby more capable to discharge a large Quantity of Moisture than such Trees as are entirely destitute of Leaves; so that it is impossible such Trees can thrive, where the Moisture is too great about their Roots.

The Seasons for planting are various, according to the different Sorts of Trees, or the Soil in which they are planted, for such Trees whose Leaves fall off in Winter; the best Time is the Beginning of *October*, provided the Soil be dry, but for a very wet Soil, it is better to defer it until the latter End of *February*, or the Beginning of *March*; and for many Kinds of Evergreens, the Beginning of *April* is by far the best Season, though some Sorts may be safely removed at *Midsummer*, provided they are not to be carried very far; but you should always make Choice of a cloudy Season, if possible at that Time of the Year, when they will take fresh Root in a few Days. And, on the contrary, when these Trees are removed in Winter during which Time they are almost in a State of Rest,

they do not take Root until the Spring advances, and sets the Sap in Motion; so that many Times they die, especially if the Winter proves severe.

As to preparing the Soil for planting that must also be done to suit the different Sorts of Trees, some requiring a light Soil, others a strong one, &c. But this is fully set down in the several Articles of Trees, under their proper Heads, to which the Reader is desired to turn, though for the Fruit Trees in general, a fresh Soil from a Pasture Ground, which is neither too light and dry, nor overstrong and moist, but rather a gentle soft loamy Earth is to be preferred, provided it be exposed some Time. And if it be for Wall Trees, it will be the better if the Borders are filled with this Earth six or eight Feet wide, but it need not be above two Feet and a Half deep at most; for when the Borders are made too deep, the Roots of these Trees are enticed downward, which is of bad Consequence to Fruit Trees, as hath been elsewhere observed. The same also must be observed for Standard Trees (where fresh Earth is brought to the Places in which they are planted), not to make the Holes too deep, but rather let them have the same Quantity of Earth in Width, which is much to be preferred.

There are several Persons who direct the placing of the same Side of the Tree to the South, which before removing had that Position, as a material Circumstance to be strictly regarded; but from several Trials which I have made, I could not observe the least Difference in the Growth of those Trees which were so placed, and others which were reversed; so that I conclude it is not of any Consequence to observe this Method.

The Distance which Trees should be planted at, must also be proportioned to their several Kinds, and the several Purposes for which they are intended, all which is explained under their several Heads; but Fruit Trees, planted either against Walls or for Espaliers should be allowed the following Distances: For most Sorts of vigorous shooting Pear Trees 36 Feet; for Apricots 16 or 18 Feet; Apples 25 or 30 Feet; Peaches and Nectarines, 12 Feet; Cherries and Plums 25 Feet according to the Goodness of the Soil, or the Height of the Wall.

What hath been mentioned on this Article chiefly relates to Fruit Trees and Evergreens, for adorning Gardens; but I shall now proceed to the planting of Forest and other Trees, which are in all large Plantations of Parks and extensive Gardens the most numerous. The modern Practice of transplanting these Sorts of Trees from Hedge-rows and Woods of large Sizes, and at a great Expence, has too generally prevailed in this Kingdom, the Generality of Planters being in too great Hast, and by a mistaken Notion of saving Time, begin by transplanting such large Trees as they find on their own Estates, or they can procure in their Neighbourhood, and please themselves with the Hopes of having fine Plantations soon; but if, instead of removing these Trees, they would begin by making a Nursery, and raising their Trees from Seeds, they would set out in a right Method, and save a great Expence and much Time, and they would have the constant Pleasure of seeing their Trees annually advance in Growth, instead of their growing worse, as will always be the Case where old Trees are removed, though many Persons

flatter themselves with the Hopes of success, when they find their Trees shoot out the following Season; and as these will often continue to grow for some Years after, so they continue their Expectations, till after a Number of Years (when they might have had seedling Trees grown up to a fine Size, if they had been sown at the Time the large Trees were planted) they find their Trees annually decaying, when they most expected their Increase; for of all the Plantations which I have yet seen of these large Trees of any Sort, there is not one which has ever succeeded. And if those Persons who are disposed to plant, would be so kind to themselves as to survey with Attention, as many of the modern Plantations as they conveniently can, they will be convinced of the Truth of this Fact; but there are very few who give themselves Time to deliberate before they begin, so that until they meet with Disappointments, they scarce reflect on what they are doing. And it too often happens, that the Persons employed in the executing, either through Ignorance, or some other Motive, encourage this Practice.

In some of these Plantations, all the Elms which could be procured from the neighbouring Hedge Rows have been removed, most of which have been Suckers produced from the old Stumps, so have scarce any Roots: These have, at a great Expence, been planted and watered, and perhaps many of them have made considerable Shoots, the Length of the Stem all the Way at every Knot, and many of them have continued ten or twelve Years alive, but have not increased in the Girth of their Stems half an Inch, and all that Time have been decaying at their Heart, and growing hollow; so that when a severe Frost in Winter, or a great Drought in Summer, has happened, there has been an almost total Destruction of the Trees.

In other Places I have seen great Numbers of tall Oaks transplanted, which have appeared to thrive when first planted; but in five or six Years have begun to decay at their Top, and have leisurely died to the Ground, than which nothing can be a more disagreeable Sight to the Owner. And the Method which is commonly practised in transplanting these Trees would destroy them, were there a Possibility of such large Trees surviving their Removal, which is, that of cutting off all their Branches; for, were the same practised by a Tree of the same Age unremoved, it would stint the Growth so much as not to be recovered in several Years, nor would it ever arrive to the Size of such as have all their Branches left on them. But the Reason given for this Practice is, that if the Branches were left upon the Trees, they could not be supported, the Winds would throw them out of the Ground; and another (which is bad Philosophy) is, that as the Roots have been greatly reduced by transplanting, so the Heads of the Trees should be reduced in the same Proportion. As to the first, it must be allowed, that Trees which are removed with great Heads, are with great Difficulty preserved in their upright Situation; for the Winds will have such Power against the Branches as to overset the Trees, if they are not very strongly supported with the Ropes. Therefore this may be brought as an Objection to transplanting large Trees, rather than in Support of a Practice which is so prejudicial to them; and as to the other Reason, it has no Foundation

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dation; for if large Amputations are made at the Root, there should not be the same practised on the Head; because the wounded Part of the Head will imbibe the Air at every Orifice, to the great Prejudice of the Tree. Beside this, if we pay any Regard to the Doctrine of the circulating of the Juices in Plants, we must allow, that the Heads of the Trees are equally useful to nourish the Roots, as the Roots are to the Heads; so that if there is a Waste of Sap both at the Top and Bottom of the Trees, it must weaken them in Proportion. For whoever will be at the Trouble to try the Experiment on two Trees of equal Age and Health, and cut the Branches off from one, and leave them upon the other at the Time of transplanting; if the latter is well secured from blowing down, it will be found to succeed much better than the other; or if the same Thing is practised upon two Trees left standing, the Tree whose Branches are cut off, will not make half the Progress as the other, nor will the Stem increase in its Bulk half so fast. Therefore where Trees are transplanted young, there will be no Necessity for using this unnatural Amputation, and the Success of these Plantations will always give Pleasure to the Owner. I have seen some Plantations of Oak Trees, which were made fifty Years ago, and had thriven beyond Expectation most Part of the Time, but are now annually decaying, and seem as if they would not continue many Years longer, when the Trees on the same Soil and in the same Situation, which were left standing, are in perfect Health and Vigour; and some of these transplanted Trees which have been cut down, were found to be of little Value, their Timber being shaken and bad.

It is common to hear Persons remark, that from the present Spirit of planting, great Advantages will accrue to the Publick by the Increase of Timber; but whoever is the least skilled in the Growth of Timber must know, that little is to be expected from any of the Plantations which have lately been made; for there are few Persons who have had this in their View when they commenced Planters, and of those few scarce any of them have set out right; for there never was any valuable Timber produced from Trees which were transplanted of any considerable Size, nor is any of the Timber of the Trees which are transplanted young, equal in Goodness to that which has grown from the Seeds unremoved. Beside, if we consider the Sorts of Trees which are usually planted, it will be found, that they are not designed for Timber; so that upon the whole, it is much to be doubted, whether the late Method of planting has not rather been prejudicial to the Growth and Increase of Timber, than otherwise.

Before I quit this Subject of planting, I must beg Leave to observe, that most People are so much in a Hurry about planting, as not to take Time to prepare their Ground for the Reception of Trees; but frequently make Holes and stick in the Trees, among all Sorts of Rubbish which is growing upon the Land; And I have frequently observed, that there has not been any Care afterward taken, to dig the Ground, or root out the noxious Plants; but the Trees have been left to struggle with these bad Neighbours, who have had long Possession of the Ground, and have established themselves so strongly, as not to be easily overcome; therefore what

can be expected from such Plantations? This is to be understood of deciduous Trees, for the Pines and Firs, if once well rooted in the Ground, will soon get the better of the Plants and destroy them.

There are some other Persons who begin better than the former, and who will be at the Expence of preparing the Ground and of planting their Trees, but afterward take very little Care of them; so that it is common to see them overgrown with Weeds, in a Year after they are planted, whereby the Trees receive so much Injury as to retard their Growth, and many Times, if the Trees are young, they are totally destroyed.

Therefore I would advise every Person who proposes to plant, to prepare the Ground well before hand, by trenching or deep ploughing it, and clearing it from the Roots of all bad Weeds; for by so doing there will be a Foundation laid for the future Success of the Plantation. Also I advise no Person to undertake more of this Work than he can afterward keep clean, for all Plantations of deciduous Trees will require this Care, at least for 7 Years after they are made, if they hope to see the Trees thrive well. Therefore all small Plantations should have the Ground annually dug between the Trees; and as to those which are large, it should be ploughed between them. This will encourage the Roots of the Trees to extend themselves, whereby they will find a much greater Share of Nourishment, and by loosening the Ground, the Moisture and Air will more easily penetrate to the Roots, to the no small Advantage of the Trees. But besides this Operation, it will be absolutely necessary to hoe the Ground three or four Times in Summer, either by Hand or the Hoe Plough. This I am aware will be objected to by many, on Account of the Expence; but if the first Hoeing is performed early in the Spring, before the Weeds have gotten Strength, a great Quantity of Ground may be gone over in a short Time; and if the Season is dry when it is performed, the Weeds will presently die after they are cut; and if this is repeated before the Weeds come up again to any Size, it will be found the cheapest and very best Husbandry; for if the Weeds are suffered to grow till they are large, it will be a much greater Expence to root them out, and make the Ground clean; beside, the Weeds will rob the Trees of great Part of their Nourishment. I have sometimes been told, That it is necessary to let the Weeds grow among Trees in Summer, in order to shade their Roots, and keep the Ground moist, but this has come from Persons of no Skill; but as others may have been deceived by such Advice, I imagine it may not be improper to give some Answer to this. And here I must observe, That if Weeds are permitted to grow, they will draw away all Moisture from the Roots of the Trees, for their own Nourishment, so that the Trees will be thereby deprived of the kindly Dews and gentle Showers of Rain, which are of great service to young Plantations, and these will be entirely drawn away by the Weeds, which will prevent their penetrating the Ground, so that it is only the great Rains which can descend to the Root of the Trees. And whoever has the least Doubt of this Matter, if they will but try the Experiment, by keeping one Part of the Plantation clean, and suffer the Weeds to grow on another they will soon be convinced of the Truth by the Growth of the

the Trees. And though this Cleaning is attended with an Expence, yet the Success will overpay it, beside the additional Pleasure of seeing the Ground always clean.

PLANTING REVERSE: Dr. *Agricola* tells us; That he had made several Experiments on the Branches of foreign Trees, as well Orange as Laurel, which he performed after the Manner following: He first stripped the Branches of all the Leaves; then he bent and tied them, dressed them with his noble Mummy, and planted them the Reverse Way, so that nothing was to be seen of all the Branches, but the great Ends, and kept them during the Winter in his Stove.

He adds, That those who have a Mind to raise Trees this Way, which he calls monstrous Fruit Trees, may raise Apples, Pears, Cherries, Apricots, Peaches, Mulberries, Walnut Trees, &c. also Rose Trees, Gooseberry Bushes, &c. which he directs to do something more at large, as follows:

Take those Branches that are furnished with long Side Shoots or Twigs, and bend the Side Twigs in the Joints toward the great Branches, and tie them together with Bals or Packthread; then dress them with Mummy either with a Brush only near the Ligature, and here and there on the Joints, or dip them entirely into it; then having made a deep Hole in the Ground, set the Branches the reverse Way, so that nothing but the long End of the Branch appears above Ground, the rest being covered with good, fat, and well broken Earth. This being done, the little Branches will take Root in the Joints every where; then the Buds will begin to shoot, so that you may see fifty or sixty more Branches spring up, making an agreeable as well as monstrous Figure.

Mr. *Fairchild* of *Hoxton* had begun to put the same into Practice, and he himself gives Directions for performing it as follows:

First, to make Choice of a young Tree of one Shoot, either of Alder, Elm, or Willow, or any other Tree that will take Root easily by Laying, and to bend the extreme Part of the Shoot down gently into the Earth, and so let it remain till it has taken Root, so that the Plant then will resemble an Arch, or bent Bow above the Ground.

When this Top End has well struck new Roots, to dig about the first Root, and raise it gently out of the Ground, till the Stem is upright, and so stake it up, otherwise it will be apt to bend.

Then to prune those Roots that are erected in the Air, from the Bruises and Wounds which they received, in being dug up, and do over with a Brush the pruned Parts with the following Composition, moderately warm:

Take four Ounces of Tallow, four Ounces of Bees Wax, two Ounces of Refin, and two Ounces of Turpentine, melted together in a Pipkin.

After this prune off all the Buds or Shoots that are upon the Stem or Plant, and dress the Wound with the same Composition, to prevent any collateral Shootings, that may spoil the Beauty of the Stem.

Besides, Care is to be taken, that the new-growing Roots of this reversed Plant be well nourished; and therefore that Part of the Shoot which was the larger, is to be cut away a little below the Earth, that the Stem may be better nourished, and its Roots translated.

These Experiments are curious but not useful, because

these reversed Trees never shoot perpendicular, but their Branches incline to the Ground, retaining their former Method of growing.

PLATANUS *Tourn. Inst. R. H.* 500. *Lin. Gen. Plant.* 954. [ελάται, of ελάτις, broad, because the Leaves of this Tree are broad.] The Plane Tree.

The Characters are,

It hath male and female Flowers growing separate on the same Tree. The male Flowers are collected in a round Ball; they have no Petals, and very small Empalements; they have oblong coloured Stamina, which are terminated by four cornered Summits. The female Flowers have small scaly Empalements, and several small concave Petals, with several Awl-shaped Germina sitting upon the Styles, crowned by recurved Sigmæ; these are collected in large Balls. The Germen afterward turns to a roundish Seed sitting upon the bristly Style, and surrounded with downy Hairs.

The Species are,

1. **PLATANUS foliis palmatis.** *H. C.* 447. Plane Tree with Hand-shaped Leaves. This is the *Platanus Orientalis verus.* *Park. Th.* 1427. True Eastern Plane Tree.

2. **PLATANUS foliis lobatis.** *Hort. Cliff.* 447. Plane Tree with lobated Leaves. This is the *Platanus Occidentalis aut Virginienfis.* *Park. Theat.* 1427. Occidental or Virginian Plane Tree.

These two are undoubtedly distinct Species, but there are two others in the *English* Gardens, which I suppose to be Varieties that have accidentally risen from Seed; one is titled the Maple-leaved Plane Tree, and the other is called the *Spanish* Plane Tree.

The 1st Sort grows naturally in *Asia*; this grows to a very great Size, the Stem is tall, erect, and covered with a smooth Bark which annually falls off; it sends out many Side Branches, which are generally a little crooked at their Joints; the Bark of the young Branches is of a dark brown inclining to a purple Colour, these are garnished with Leaves placed alternate; their Foot Stalks are one Inch and a Half long; the Leaves are seven Inches long and eight broad, deeply cut into five Segments, and the two outer are slightly cut again into two more; these Segments have many acute Indentures on their Borders, and have each a strong Mid-rib, with many lateral Veins running to the Sides; the upper Side of the Leaves are a deep green, and the under Side pale. The Flowers come out upon long Foot Stalks or Ropes hanging downward, each sustaining five or six round Balls of Flowers; the upper which are the largest, are more than four Inches in Circumference, these sit very close to the Foot Stalks. The Flowers are so small as scarce to be distinguished without Glasses; they come out at the same Time as the Leaves, which is in *June*, and in warm Summers the Seeds will ripen late in *Autumn*; and if left upon the Trees will remain till *Spring*, when the Balls fall to pieces, and the bristly Down which surrounds the Seeds, help to transport them to a great Distance with the Wind.

The 2d Sort grows naturally in most Parts of *North America*; this Tree also grows to a large Size the Stem very strait, and of equal Girt most Part of the Length; the Bark is smooth, and annually falls off like that of the other; the Branches extend wide on every Side; the young ones have a brownish Bark, but the old ones have a gray Bark; the Foot Stalks of the

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Leaves are 3 Inches long; the Leaves are 7 Inches long and 10 broad; they are cut into 3 Lobes or Angles, and have several acute Indentures on their Borders, with 3 longitudinal Mid-ribs, and many strong lateral Veins. The Leaves are of a light green on their upper side, and paler on their under. The Flowers grow in round Balls like the former, but are smaller. The Leaves and Flowers come out at the same Time with the former, and the Seeds ripen in Autumn.

That called the Maple-leaved Plane, is certainly a feminal Variety of the Eastern Plane, for the Seeds which scattered from a large Tree of this Kind in the *Chelsea* Garden, have produced Plants of that Sort several Times. This differs from the two Sorts before mentioned, in having its Leaves not so deeply cut as those of the Eastern Plane, but they are divided into 5 Segments, so are much deeper cut than those of the Occidental Plane. The Foot Stalks of the Leaves are much longer than those of either of the former, and the upper Surface of the Leaves is rougher, so that any Person might take them for different Species, who had not seen them rise from the same Seeds.

The *Spanish* Plane Tree has larger Leaves than either of the other Sorts, which are more divided than those of the Occidental Plane Tree, but not so much as the Eastern. Some of the Leaves are cut into five, and others but three Lobes; these are sharply indented on their Edges, and are of a light green; the Foot Stalks are short, and covered with a short Down. This is by some called the middle Plane Tree, from its Leaves being shaped between those of the two other Sorts. It grows rather faster than either of the other Sorts, but I have not seen any very large Trees of this Kind.

The 1st Sort was brought out of the *Levant* to *Rome* where it was cultivated with much Cost and Industry: The greatest Orators and Statesmen among the *Romans* took great Pleasure in their *Villas*, which were surrounded with *Platani*; and their Fondness for this Tree became so great, that we frequently read of their irrigating them with Wine instead of Water. *Pliny* affirms, that there is no Tree whatsoever which so well defends us from the Heat of the Sun in Summer, nor admits it more kindly in Winter, the Branches being produced at a proportionable Distance to the largeness of their Leaves (which is what holds through all the different Sorts of Trees yet known;) so that when the Leaves are fallen in Winter, the Branches growing at a great Distance, easily admit the Rays of the Sun.

This Tree was afterwards brought to *France*, where it was cultivated only by Persons of the first Rank; and so much was the Shade of it prized, that if any of the Natives did but put his Head under it, they exacted a Tribute from him.

It is generally supposed, that the Introduction of this Tree into *England* is owing to the great Lord Chancellor *Bacon*, who planted a noble Parcel of them at *Verulam*, which were there very flourishing some Years since, but have lately been destroyed. But notwithstanding its having been so long in *England*, yet there are but very few large Trees to be seen of it at present; which may, perhaps, be owing to the great Esteem the Persons of the last Age had for the Lime, which was a

fashionable Tree in the last Age, and being much easier to propagate, and of quicker Growth during the three or four first Years, than the Plane Tree, thereby became the most common Tree for Avenues and shady Walks near Habitations in *England*. But since the Defects of that Tree have been more generally discovered, the Elm has had the Preference, and is now the most commonly planted for such Purposes.

However, notwithstanding what has been said of the Plane Tree, of its Backwardness in coming out in the Spring, and the sudden Decay of its Leaves in Autumn; yet for the goodly Appearance, and great Magnitude to which it will grow, it deserves a Place in large Plantations, or shady Recesses near Habitations, especially if the Plantation be designed on a moist Soil, or near Rivulets of Water, in which Places this Tree will arrive to a prodigious Magnitude.

We read of one of these Trees, which was growing at a *Villa* of the Emperor *Caligula*, whose Trunk was so large, as when hollowed, to make a Room therein, capacious enough to entertain ten or twelve Persons at a Repast, and for their Servants to wait upon them. And there is mention made of one of these Trees, which was growing in the Eastern Country, which was of so great a Magnitude, that *Xerxes* made his Army (which consisted of seventeen hundred thousand Men) halt for some Days, to admire the Beauty and Tallness of this Tree; and became so fond of it, as to take his own, his Concubines, and all the great Persons Jewels to cover it; and was so much enamoured with it, that for some Days, neither the Concern of his grand Expedition, nor Interest, nor Honour, nor the necessary Motion of his prodigious Army, could dissuade him from it; he filled it, *His Mistress, His Minion, His Goddess*; and when he was obliged to part with it, he caused a Figure of it to be stamped on a Gold Medal, which he continually wore about him.

And such was the Esteem which the People of *Asia* had for this Tree, that where-ever they erected any sumptuous Buildings, the Porticoes, which opened to the Air, terminated in Groves of these Trees.

The Eastern Plane Tree is propagated from Seeds, or by Layers, the latter of which is generally practised in *England*; though the Plants thus raised seldom make so large strait Trees, as those which are produced from Seeds; but it has been generally thought, that the Seeds of this Tree were not productive, because they have not been sown at a proper Season, nor managed in a right Manner; for I have had Thousands of the young Plants spring up from the Seeds of a large Tree, which scattered upon the Ground in a moist Place; and I since find, that if these Seeds are sown soon after they are ripe, in a moist shady Situation, they will rise extremely well; and the Plants thus obtained, will make a considerable Progress after the second Year, being much hardier and less liable to lose their Tops in Winter, than those which are propagated by Layers. And since the Seeds of this Tree ripen well in *England*, they may be propagated in as great Plenty as any other Forest Tree.

The *Virginian* Plane Tree will grow extremely well from Cuttings, if they are planted the Beginning of *October* upon a moist Soil; and if they are watered in dry
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Weather, will make a prodigious Progress; so that in a few Years from the planting, they will afford noble Trees for Avenues, and other shady Walks; their Trunks are perfectly strait, growing nearly of the same Size to a considerable Height, there being the least Difference in the Girt of this Tree, for several Yards upwards, of any other Sort of Tree whatsoever. The Hon. Paul Dudley, Esq; in a Letter to the Royal Society, mentions one of these Trees, which he observed in *New England*, whose Girt was nine Yards, and held its Bigness a great Way up, which Tree, when cut down, made 22 Cords of Wood. He also says, in the same Letter, That he had propagated many of these Trees by cutting off Sticks of 5 or 6 Feet long, and setting them a Foot deep into the Ground in Spring, when the Season was wet, and that they always thrive best in a moist Soil.

They are all propagated very easily by Layers, every Twig of them will take Root, if they are but covered with Earth; these Layers will be well rooted in one Year, when they should be cut off from the old Trees or Stools, and planted in a Nursery, where they may remain two or three Years to get Strength, and then be transplanted where they are to remain, for the younger these Trees are planted, the better they will thrive. An Experiment of this I made in 1731, when I planted one of these Trees, whose Stem was eight Inches in Girt, and near it, in the same Soil and Situation, I planted another, whose Girt was not three Inches, and the latter is now much larger than the former, and gains more in one Year than the other does in three.

PLOWING OF LAND.

There is not a greater Improvement of arable Land than that of well ploughing it, by which Method the Soil is pulverized, and rendered fit to receive the Fibres of Plants; the oftener this is repeated, and the better it is performed, the greater Improvement is made. But there are not many of the Practitioners of the Art of Husbandry, who attend enough to this Part of it, most of them contenting themselves with going on in the old beaten Road of their Predecessors; so that the only Persons, who have made such Improvement in this Part of Agriculture, are the great Gardeners, who cultivate most of their Land with the Plough; therefore they have imitated, as near as possible, the Use of the Spade in labouring their Ground.

The Difference between digging Land with the Spade, and ploughing, consists in the Parts of the Earth being much more divided by the former, than the latter Method; therefore those Gardeners, who are curious in working their Land, oblige their Labourers to spit the Ground as thin as possible, that there may remain no large Clods unbroken; so, when Land is ploughed, the same Regard should be had to break and pulverize the Parts as much as possible; for when there are great Clods left unbroken, the Fibres of Plants never penetrate farther than the Surface of them, so that all the Salts, included in these Lumps of Earth, are locked up, that the Plants can receive no Benefit from them; and these Clods, in Proportion to their Size, make such Interstices, that the Air often penetrates through, and greatly injures the tender Fibres of the Roots. Therefore the oftener the Land is ploughed,

and the more the Parts are separated and pulverized, the better will the Plants be nourished and fed; but particularly in all strong Land, this Part of Husbandry will be the most beneficial, but this cannot be effected under four or five Ploughings, and by using such Ploughs as have either two or four Coulters, which will cut and separate the Clods much better than it can be performed by the common Plough; and in the operation, great Care should be had to the Breadth of the Furrow, for when these are made too broad, it will be impossible to break and separate the Parts sufficiently. In some Countries, where the Husbandmen are not very expert in the Use of the Plough, I have seen Gentlemen oblige them to plough by a Line, and they have set out the exact Width of each Furrow. This not only adds a Neatness to the Ground, but likewise, by keeping the Furrows strait, and at equal Distances, the Land will be more equally worked; but many of the good Ploughmen, in the Counties near *London*, will direct the Plough as strait by their Eye, as if they were to use a Line.

Another Thing to be observed in ploughing Land is that of going to a proper Depth, for if the Surface only be broken up and pulverized, the Roots of whatever Plants are sown upon it will in a very short Time reach the Bottom, and meeting with the hard unbroken Soil, they are stopped from getting farther, and of Consequence the Plants will stint in their Growth; for there are few Persons who have attended enough to the downright Growth of the Roots of Plants, and only have had Regard to the Roots of those Plants, which are of a strong fleshy Substance, and are called Tap Roots, being in Form of Carrots. These they suppose will require to have the Land wrought to a greater Depth, that the Roots may run down, and be the longer; for in that Particular their Goodness consists. But they do not think that the small fibrous-rooted Plants ever require so much Depth to run into the Ground, and in this they are greatly mistaken; for I have traced the small Fibres of Grass and Corn above three Feet deep in the Ground. And if any Person is curious to observe the Length of the Fibres of Plants, if they will but plant one of each Sort into a small Pot of Earth, and keep them duly watered, till the Plants are advanced to flower, and then turn them out of the Pots carefully, so as not to break any of the Fibres of the Roots, and after separating the Earth from them, measure the Length of their Roots, they will be found much greater than most People imagine. I have myself frequently traced the Roots of Plants, which have surrounded the Pots upward of twelve Times, and the Roots of some strong-growing Plants, which have gotten through the Holes in the Bottom of Flower Pots, have in three Months Time extended themselves ten or eleven Feet from the Plant; therefore the deeper the Ground is laboured, the greater Benefit the Plants will receive from it, but it must be understood only of such Land as the Staple is deep enough to admit of this; for if the Soil is shallow, and either Gravel Chalk, or Stone lie beneath, it will be very imprudent to turn up either of these; therefore the Depth of the Furrows in such Lands much be determined by the Staple of the Land. By the Word Staple must be understood all that Depth of Soil next the Surface, which is proper for the Growth

of Vegetables. Where Clay is next the Staple, provided it is not of the blue or Iron-mould Sort, there will not be the same Danger of going a little deeper than the Staple, as in either of the before-mentioned Sorts of Land; for if the Clay be of a fat Nature, when it hath been well exposed to Air, and often laboured, it will be capable of affording a large Share of Nourishment to the Crops.

If between each ploughing, a Harrow with long Teeth is made use of to tear and break the Clods, it will be of great Service to the Land, for the more it is stirred by different Instruments, the better will the Parts be separated and pulverized; so that the common Method, as practised by the Farmers when they fallow their Land, is far from answering the Intention, for they plough up the Ground, leaving it in great Clods for some Months, and frequently, during this Time, Thistles and all bad Weeds are suffered to grow upon the Land, and exhaust the Goodness of it, and perhaps, just before the Seeds are sown, they give it two more Ploughings. This is what the Farmers call good Husbandry, but if instead of this Method they would labour the Ground often with the Plough, a Harrow, and heavy Roller, to break and separate the Parts, and never suffer any Weeds to grow on the Land, during its lying fallow, I am sure they would find their account in it; first, by the Growth and Increase of their Crops; and afterward, by a saving in the Weeding; for if no Weeds are suffered to grow to shed their Seeds, during the Time of fallowing, but few will come up when the Ground is sown, in Comparison with what would otherwise, in the common Husbandry.

In many of the old Gardens near London, occupied by Kitchen Gardeners, when the upper Surface of the Ground is exhausted by the continual Crops which they get from it, it is a common Method to trench the Ground two or three Spades Depth, and turn the bottom Soil upward, by this the Land is fresh, and produces very good Crops for some Years after. In Imitation of this, many of the farming Gardeners, who make Use of the Plough, have two or three men following the Plough in the Furrows, who turn up a Spit in the Bottom of each Furrow; and where the Soil is good, they throw it on the Surface, but it otherwise, they level it in the Bottom, and this loosening of the Ground renders it capable of admitting the Roots of the Plants.

The Ploughing already mentioned is intended to prepare the Land for the Reception of the Seeds which are proposed to be sown, and as before observed, the oftener and better this is performed, the more the Land will produce. But, beside this, there will be a Necessity for stirring the Ground to destroy the Weeds, after the Crop is growing, for if the Weeds are suffered to grow with the Crop, they will draw away most of the Nourishment, and greatly lessen their Produce. Therefore in Gardens this Work is generally performed by Hand, with an Instrument called a Hoe, unless when the Ground is very stiff, and subject to bind; in which Case it will be proper to make use of Forks to break and loosen the Earth between the Crops, and the oftener this is repeated, the better will the Crops succeed, and this Husbandry I have seen attended with great

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Advantage. But in the large open Fields of Beans, Peas, and other large-growing Plants, which are planted in Rows, the Ground between may be frequently stirred with a small Swing-plough, which will destroy the Weeds, pulverize the Ground, and give Nourishment to the Crop; for as all Land is apt to bind, or the Parts coalesce by lying unstirred, the more and oftener it is stirred, the better will it be kept loose, and thereby rendered proper for the Growth of Plants. This Sort of ploughing is termed Horse-hoeing, and there being a particular Treatise upon this Sort of Husbandry written by Mr. *Jethro Tull* of *Shelbourn* in *Berkshire*, in which the Instruments are figured and described, I shall refer those, who are desirous to practise this Husbandry, to the Book itself, and shall only take Notice, that although the Instrument used in this Operation is a Plough, yet it is termed Hoeing, as it is intended to destroy the Weeds, and to stir the Ground but a small Depth to distinguish it from the ploughing to prepare the Land for the Crop.

PLUMBAGO. *Tourn. Inst. R. H.* 140. *Tab.* 53. *Lin. Gen. Plant.* 196. Leadwort.

The Characters are,

The Flower has a tubulous, five-cornered, permanent Emplacement of one Leaf, which is indented at the Top in 5 Parts; it hath one Petal which is Funnel-shaped; it hath a cylindrical Tube which is narrow at the Top. The Brim is cut into 5 Parts which are oval and spreading; it has 5 Awl-shaped Stamina situated in the Tube sitting upon the Valves of the Nectarium, which includes the Germen. The small oval Germen sustains a single Style, the Length of the Tube, crowned by a slender five-pointed Stigma. The Germen becomes a single oval Seed included in the Emplacement.

The Species are,

1. PLUMBAGO *foliis amplexicaulis*. *Hort. Cliff.* 53. Leadwort with Leaves embracing the Stalks. *Plumbago quorundum*. *Clus. Hist.* 123. Leadwort or Toothwort.

2. PLUMBAGO *foliis petiolatis*. *Hort. Cliff.* 53. Leadwort with Leaves having Foot Stalks. This is the *Plumbago Americana*, *betae folio ampliori*. *Plum. Cas. American* Leadwort with a larger Beet Leaf.

These are all the Sorts which I have observed in the English Gardens. The first grows naturally in the South of France, in Italy, and Spain; this hath a perennial Root, which strikes deep into the Ground, from which arise many slender Stalks about 3 Feet high, which are channelled, and garnished with oval Spear-shaped Leaves about 3 Inches long, and 2 broad, whose Base embraces the Stalks; they are smooth, entire, and of a grayish Colour. The upper Part of the Stalks sends out many side Branches which are slender, and are garnished with small Leaves. These and also the principal Stalks are terminated by Tufts of blue Flowers, which are small, Funnel-shaped, and have pretty long Tubes; these are succeeded by oblong, rough, hairy Seeds. This Plant seldom flowers till October in England, so never produces ripe Seeds here. There is a Variety of this with white Flowers and pale Stalks, which is supposed to have risen from the Seeds of the former.

The Stalks decay in Winter, and new ones come up the following Spring; they are propagated by parting

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their Roots, which send out Heads in Plenty. These may be divided at any Time, when the Weather is mild, from the Time the Stalks decay, till the Roots begin to shoot in Spring; it should have a light Soil and warm Situation, otherwise it will not flower here. The Roots should be allowed Room to spread, and the Stalks require Support; if the Plants are kept clean from Weeds, and the Ground between them dug every Winter, it is all the Culture they require.

It is called *Dentillaria* or Toothwort by many Authors, who recommend its Virtues in curing the Tooth-ach, being of a hot caustick Nature like Pellitory of Spain.

The 2d Sort grows naturally in both Indies; this is a perennial Plant, with a strong fibrous Root, from which arise many slender Stalks, which grow near 4 Feet high, garnished with smooth, oval, Spear-shaped Leaves about 3 Inches long, and one and a Half broad near their Base, ending in acute Points; these are placed alternate, standing on short Foot Stalks. The upper Part of the Stalks divides into small Branches, garnished with small oval Leaves, and terminate in Spikes of white Flowers, which have long slender Tubes, cut into 5 Segments at the Brim, which spread open; these are succeeded by oblong Seeds covered with the prickly Empalement. The upper Part of the Stalks, and the Empalements of the Flowers are very glutinous, sticking to the Fingers if touched, and the small Flies which settle upon them are fastened, so cannot get off again. This Plant is too tender to thrive in the open Air in England, so requires a moderate Stove, where they will continue flowering great Part of the Year, and those Flowers, which appear early in Summer, will be succeeded by ripe Seeds in Autumn.

This is propagated by Seeds, which should be sown on a good hot Bed in Spring, where the Plants will come up in about five or six Weeks. When these are fit to remove, they should be each planted into a small Pot filled with light loamy Earth, and plunged into a hot Bed of Tan, observing to screen them from the Sun, till they have taken new Root; afterward they must be treated like other Plants from the same Country. In Summer they should have a large Share of fresh Air admitted to them in warm Weather, and require Water every other Day in Moderation. In Winter they should be kept in a moderate Temperature of Warmth, and must be more sparingly watered. With this Management the Roots will abide several Years, and produce Plenty of Flowers and Seeds.

PLUM-TREE. See Prunus.

PLUMERIA. Tourn. *Inst. R. H.* 659. *Lin. Gen. Pl.* 263. Red Jasmine; in French, *Frangipanier*.

The Characters are,

The Flower has a small obtuse Empalement divided into five Parts; it hath one Funnel-shaped Petal, with a long Tube, enlarging upward, and cut into five oblong oval Segments at the Top, which spread open; it hath five Awl-shaped Stamina, situated in the Center of the Tube, terminated by Summits which close together, and an oblong bifid Germen, with scarce any Style, crowned by a double acute Stigma. The Germen afterward becomes a long, swelling, acute-pointed Capsule with one Cell filled with

winged Seeds placed over each other like Scales of Fish, fastened at their Base to the Sides of the Capsule.

The Species are,

1. *PLUMERIA foliis ovato-oblongis*. Hort. Cliff. 76. *Plumeria* with oblong oval Leaves. This is the *Plumeria flore roseo odoratissimo*. *Inst. R. H.* 659. *Plumeria* with a Rose-coloured sweet-scented Flower, commonly called in the *West-Indies* red Jasmine.

2. *PLUMERIA foliis ovato-oblongis, ramis patulis, floribus corymbosis*. *Plumeria* with oblong oval Leaves, spreading Branches, and Flowers growing in a Corymbus. This is the *Plumeria flore majore odorato & incarnato*. *Plumeria* with a larger sweet-scented and incarnate Flower, called in the *West-Indies* the Japan Tree.

3. *PLUMERIA foliis lanceolatis revolutis, pedunculis supernè tuberosis*. *Lin. Sp. Plant.* 210. *Plumeria* with Spear-shaped Leaves which turn backward, and the Foot Stalks having Swellings on the upper Side. This is the *Plumeria flore nivea, foliis longis angustis & acuminatis*. *Inst. R. H.* *Plumeria* with a snowy Flower, and long narrow-pointed Leaves.

4. *PLUMERIA foliis lanceolatis petiolatis obtusis*. *Lin. Sp. Plant.* 210. *Plumeria* with Spear-shaped obtuse Leaves having Foot Stalks. This is the *Plumeria flore nivea, foliis brevioribus & obtusis*. *Inst. R. H.* *Plumeria* with a snowy Flower, and shorter blunt Leaves.

5. *PLUMERIA foliis linearilanceolatis longissimis*. *Plumeria* with very long, narrow, Spear-shaped Leaves.

The Title was given to this Genus by Dr. Tournefort, in Honour of Father Plumier, who was Botanist to the late King of France, and a long Time in America searching after new Plants; he published a Catalogue of the Plants he discovered, with several new Genera which he constituted, in two Volumes in Folio, with Figures and Descriptions of many of the Plants.

The 1st Sort grows naturally in the Spanish West-Indies, from whence it was transplanted into most of the Islands in the West-Indies, where it is cultivated in Gardens for Ornament. It rises 18 or 20 Feet High; the Stalk is covered with a dark green Bark, having Marks where the Leaves are fallen off. The Stalks are succulent, and abound with a milky Juice, but within they are somewhat ligneous. Toward the Top they put out a few thick succulent Branches, garnished at their Ends with oval oblong Leaves of a light green Colour, having a large Mid-rib and many transverse Veins; these are full of a milky Juice. At the Ends of the Branches come out the Flowers in large Clusters; they are shaped like those of the Oleander or Rose Bay, having one Petal which is tubulous, and cut into 5 oval obtuse Segments which spread open; they are a pale red and have an agreeable Odour. When the Flowers are past, the Germen becomes a long swelling Pod filled with flat winged Seeds lying over each other like the Scales of Fish. It usually flowers here in July and August, but is never succeeded by Pods in England.

The 2d Sort I received from St. Christophers by the Name of Japan Tree; this Sort is yet very rare in the English Settlements, having been but lately introduced from the Spanish West-Indies. It is in Leaf and Stem very like the 1st, but the Stalks do not rise so high; they divide into strong spreading Branch-

es, filled with a milky Juice; the Leaves are of a thicker Consistence than those of the first, and their Veins larger; the Flowers of this are of a paler Colour, and are produced in much larger Clusters. It is very common to have upward of 20 of these Flowers open in one Bunch, and a Number to succeed these as they decay, so that the Clusters have continued in Beauty upward of 2 Months, during which Time they make a most beautiful Appearance in the Stove, and have a very agreeable Flavour.

The 3d Sort grows plentifully at *Campeachy*, from whence the late Dr. *Houssoun* sent the Seeds. He also observed some Plants of this Kind at *Jamaica*. This is not near so beautiful as the two former Sorts, the Flowers being smaller, and produced in less Bunches, and are of short Duration. But for the Beauty of their Stems and Leaves, and for the Sake of Variety, they deserve Room in every curious Collection of Plants.

The 4th Sort was discovered by Dr. *Houssoun*, growing in great Plenty near *Cartagena* in the *Spanish West-Indies*, from whence he sent the Seeds to *England*. This Sort produces small white Flowers, resembling those of the third, so is less valuable than the two first.

The Seeds of the 5th Sort were sent me by Mr. *Richard*, Gardener to the King of *France* at *Versailles*, but I had no Account of the Country from whence it was sent. This hath a Stalk very like the first Sort, but the Leaves are 9 or 10 Inches long, and not more than 2 Inches broad; they are thick, succulent, and full of a milky Juice, a little roundish at their Base, but end in acute Points. The Flowers of this are said to be yellow, but as the Plants have not yet flowered here, I can give no farther Account of them.

All these Plants may be propagated by Seeds, which must be procured from the Countries where they naturally grow; these should be sown in Pots filled with light Earth, and plunged into a hot Bed of Tanners Bark; and when the Plants are come up about two Inches high, they should be transplanted into separate small Pots filled with light sandy Earth, and plunged into the hot Bed again, observing to shade them from the Heat of the Sun in the middle of the Day, until they have taken Root; but they must not have much Water, for as all the Sorts are very succulent, being full of a milky Juice, somewhat like the *Euphorbiums*, Moisture will cause them to rot. In hot Weather the Plants should have a large Share of fresh Air, by raising the Glasses of the hot Bed every Day, in Proportion to the Warmth of the Season, to prevent their drawing up weak. Toward *Michaelmas*, when the Nights begin to be cold, the Plants should be removed into the Stove, and plunged into the Bark Bed, where they must remain during the Winter. As these Plants all cast their Leaves in the Middle of Winter, and continue destitute of them till about the Beginning of *May*, so, during that Time, they should be watered very sparingly, because they are in more Danger of rotting, while they are in a less active State, by too much Moisture, than when they are furnished with Leaves, through which the Moisture is more freely perspired.

All these Sorts are too tender to thrive in the open Air of this Country, therefore should be constantly preserved in the Stove, where, in warm Weather, they

must have a large Share of free Air, but in cold Weather they must be kept very warm. While they are young, it will be proper to continue them in the Bark Bed, but when they have obtained Strength, they may be placed in a dry Stove, where they will thrive well, provided they are kept in a moderate degree of Heat, and have not too much Water.

These Plants may also be propagated by Cuttings, taken from the old Plants a Month or six Weeks before they are planted, during which Time they should be laid on the Flues in the Stove, that the Part which joined to the old Plant may be healed over before they are planted, otherwise they will rot. These Cuttings should be planted in small Pots filled with light sandy Earth, and plunged into a moderate hot Bed of Tanners Bark, observing to shade them in the Heat of the Day from the Sun, and refresh them once in a Week or ten Days with Water, given sparingly each Time. If the Cuttings succeed, they will take Root in about two Months, when they should have a larger Share of Air to harden them by Degrees to bear the Sun and Air, and afterward may be treated as the old Plants.

The milky Juice of these Plants is very caustick, and reckoned poisonous. In cutting off any of the Branches of the Plants, if the Knife be not immediately cleaned, the Juice will corrode it, and turn the Blade almost black in a very little Time, so as not to be cleaned off again, and if dropped on Linen will cause it to wash in Holes, equal to *Aqua fortis*.

PODOPHYLLUM. *Lin. Gen. Plant.* 571. *Anapodophyllum. Tourn. Inst. R. H.* 239. *Tab.* 122. Ducks-foot, or May Apple.

The Characters are,

The Bud of the Flower is inclosed in a large, three-leaved, coloured Empalement in Form of a Sheath. The Flower has 9 roundish concave Petals plaited on their Borders, and smaller than the Empalement; it has a roundish Germen without a Style, crowned by a plaited obtuse Stigma. The Germen turns to an oval Capsule of one Cell, crowned by the Stigma, filled with roundish Seeds.

We have but one Species of this Genus in the *English* Gardens, viz.

PODOPHYLLUM foliis peltatis lobatis. *Lin. Sp. Plant.* 505. Ducks-foot with Target-shaped Leaves having Lobes. This is the *Anapodophyllum Canadense* *Morini. Tourn. Inst.* 219. *Canada* Ducks-foot of *Morinus*.

This Plant grows naturally in many Parts of *North America*. The Root is composed of many thick Tubers fastened together by fleshy Fibres, which spread, and propagate greatly under Ground, sending out many smaller Fibres which strike downward. In the Spring arise several Foot Stalks about six Inches high, which divide into two smaller, each sustaining one Leaf composed of 5, 6, or 7 Lobes, the five middle being deeply indented at the Top; these join together at their Base, where the Foot Stalk meets, which is fastened to the under Side of the Leaf like the Handle of a Target; these Leaves are smooth, and of a light green. At the Division of the Foot Stalk comes out the Flower with a large Empalement covering it like a Sheath; the Flower hath 9 large concave white Petals, which are roundish at the Top, and plaited on their

Borders. In the Center is situated a large, roundish, oval Germen crowned by a plaited obtuse Stigma, and surrounded by a great Number of short Stamina terminated by oblong, erect, yellow Summits. The Flowers appear in May, and when they fall off, the Germen swells to a Fruit of the Size and Shape of the common Hip or Fruit of the wild Rose. This is at first green, but when ripe changes to a yellow Colour, inclosing several roundish Seeds fastened to the Placenta.

This Plant propagates so fast by its creeping Roots, that few are at the Trouble of sowing the Seeds. Every Part of the Root will grow, so they may be annually parted, either in Autumn when their Leaves decay, or in Spring just before the Roots begin to shoot; they require no other Culture but to keep them clean from Weeds. It loves a light loamy Soil and a shady Situation, and is so hardy as seldom to be injured by Frost.

POINCIANA. Tourn. Inst. R. H. 619. Tab. 391. Lin. Gen. Plant. 462. Barbadoes Flower fence, or Spanish Caranacions; in French, Poincillade.

The Characters are,

The Empalement of the Flower is composed of five oblong concave Leaves which fall off. The Flower has five unequal Petals; four of them are nearly equal and roundish, but the fifth is larger, deformed, and indented. It hath ten long bristly, rising Stamina terminated by oblong Summits, and an Awl-shaped declining Germen which sits upon the Style the Length of the Stamina, and is crowned by an acute Stigma. The Germen afterward becomes an oblong compressed Pod with several transverse Partitions; in each of these is lodged a single flattish Seed.

We have but one Species of this Genus in the English Gardens, viz.

POINCIANA aculeis geminis. Hort. Upsal. 101. Flower-fence with double Spines. This is the Poinciana flore pulcherrimo. Tourn. Inst. R. H. 619. Poinciana with a most beautiful Flower.

There are two Varieties of this which were discovered by the late Dr. Houstoun in the Spanish West-Indies. One of these hath a red, and the other a yellow Flower, but as there appears to be no other Difference in the Plants from the common Sort, they must be supposed only accidental Variations, which have risen from Seeds.

This Plant grows naturally in both Indies; it is planted in Hedges to divide the Lands in Barbadoes, from whence it had the Title of Flower-fence; it is also called Spanish Carnations by some of the Inhabitants of the British Islands in the West-Indies. It rises with a strait Stalk 10 or 12 Feet high, which is covered with a smooth gray Bark, and is sometimes as thick as the Small of a Man's Leg, dividing into several spreading Branches at the Top, which are armed at each Joint with two short, strong, crooked Spines, and are garnished with decomposed winged Leaves, each Leaf being composed of 6 or 8 Pair of simple winged Leaves, the lower Pair being composed of 4 or 5 Pair of Lobes, the others gradually increasing in their Number toward the Top, where they decrease again, and are smaller. The Lobes are 3 Quarters of an Inch long, and almost Half an Inch broad at their Points, lessening gradually to their Base; they are of a light green Colour, and, when bruised, emit a strong Odour.

The Branches are terminated by loose Spikes of Flow

ers, which are sometimes formed into a Kind of Pyramid, and at others they are disposed more in Form of an Umbel. The Foot Stalk of each Flower is near 3 Inches long; the Flower is composed of 5 Petals, which are roundish at the Top, but are contracted to narrow Tails at their Base; they spread open, and are beautifully variegated with a deep red or Orange Colour, yellow, and some Spots of green; they have a very agreeable Odour. In the Center of the Flower is situated a slender Style above 3 Inches long, upon which the Germen sits, and is accompanied by ten Stamina, nearly of the same Length with the Style, terminated by oblong Summits. After the Flower is past, the Germen becomes a broad flat Pod, about three Inches long, divided into three or four Cells by transverse Partitions, each including one flattish irregular Seed. The Leaves of this Plant are used instead of Sena in the West-Indies to purge, and in Jamaica the Plant is titled Sena.

Ligon says the Seeds of this were first carried to Barbadoes from Cape Verd Islands, and the Beauty of the Flowers was such, that the Inhabitants soon spread it over that Island, and afterward it was transported into most of the neighbouring Islands. This may have been so, but it is very certain that the Plant grows naturally in Jamaica, where Dr. Houstoun found it in the Woods at a great Distance from any Settlements. He also found it growing naturally at La Vera Cruz, and at Campearby, where he also found the two Varieties with red and yellow Flowers. The only Difference between these and the first Sort being in the Colour of their Flowers, and their Branches having fewer Spines.

The Seeds are annually brought over in Plenty from the West-Indies, which, if sown upon a hot Bed, will rise easily. When the Plants are up, they should be transplanted each into a small Pot, and plunged into a hot Bed of Tanners Bark, observing to shade them from the Sun, till they have taken Root; after which you must give them Air in Proportion to the Warmth of the Season, and they must be frequently refreshed with Water. When the Plants have filled the Pots with their Roots, they should be shaken out, and placed in larger ones, that they may have Room to grow. If Care be taken to water and shift them as often as is necessary, they will grow 3 Feet high the first Season. At Michaelmas the Pots should be plunged into a fresh hot Bed of Tanners Bark in the Stove, which should be kept to the Ananas Heat marked on the Botanical Thermometers, and frequently refreshed with Water, but never give them large Quantities, which is very injurious to them at that Season. The Earth, which they should be planted in, must be fresh, light, and sandy (but not over-rich), in which they will stand the Winter better than if planted in a stronger Soil.

These Plants must constantly remain in the Bark Stove, where in warm Weather they should have a large Share of Air, but must not be exposed to Cold; they are very impatient of Moisture in Winter, and, if Damp seizes their Top, it very often kills the Plants, or at least occasions the Loss of their Heads. With proper Management they will grow much taller here than they usually do in Barbadoes, but their Stems will not be larger than a Man's Finger, which is occasioned by their being drawn up by the Glasses of the Stove. I have

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have had some of them near 18 Feet high in the *Chelsea* Garden, which have produced their beautiful Flowers some Years. These have always appeared in *December*, but in the *West-Indies* I am informed they flower twice a Year, at which Times they make a most beautiful Appearance.

POKE VIRGINIAN. See *Phytolacca*.

POLEMONIUM. *Tourn. Inst.* 146. *Lin. Gen.* 200. Greek Valerian, or Jacob's Ladder.

The Characters are,

The Flower has a permanent Emplacement of one Leaf, which is cut into 5 Segments; it has one Petal, and is of the Wheel Shape. The Tube is very short; the upper Part, which is divided, spreads open. It hath 5 slender Stamina inserted in the Valves of the Tube; these are inclined, and are shorter than the Petal, and terminated by roundish Summits. In the Bottom of the Tube is situated an acute oval Germen, supporting a slender Style, which is equal with the Petal crowned by a revolving trifid Stigma. The Germen afterward turns to a three-cornered oval Capsule, having 3 Cells filled with irregular acute-pointed Seeds.

The Species are,

1. POLEMONIUM *calycibus corollæ tubo longioribus*. *Lin. Sp. Plant.* 162. Greek Valerian with an Emplacement longer than the Tube of the Flower. This is the *Polemonium vulgare ceruleum* *Tourn. Inst. R. H.* 146. Common blue Greek Valerian.

2. POLEMONIUM *foliis pinnatis, radicibus reptatricibus*. *Flor. Virg.* 22. Greek Valerian with winged Leaves, and a creeping Root.

The first Sort grows naturally in many Parts of *Europe*; it has been discovered growing wild in *Carleton Beck*, and about *Malham Cove* near *Craven*, in *Yorkshire*. Of this are two or three Varieties, one with a white, and the other a variegated Flower, and another with variegated Leaves.

This Plant has winged Leaves, which are composed of several Pair of Lobes placed alternately. The lower Leaves have 11 or 12 Pair, and are terminated by an odd one; these are broadest at their Base, ending in Points, and sit close to the Mid-rib. The Stalks rise near a Foot and a Half high; they are hollow and channelled, and are garnished with winged Leaves of the same Form with the lower, but decrease upward in their Size; they are terminated by Bunches of Flowers, which sit very close; they have one Petal, which has a short Tube, and cut into 5 roundish Segments at the Top; they are of a beautiful blue Colour, and have each 5 Stamina, terminated by yellow Summits. These Flowers appear the latter End of *May*, and are succeeded by oval acute-pointed Capsules, with 3 Cells filled with irregular Seeds, which ripen in *August*.

These Plants are easily propagated by sowing their Seeds in Spring upon a Bed of light Earth, and when they are come up pretty strong, they should be pricked out into another Bed of the same light Earth about 4 or 5 Inches asunder, observing to shade and water them, until they have taken Root; after which they will require no farther Care, but to keep them clear from Weeds until *Michaelmas*, at which Time they must be transplanted into the Borders of the Flower Garden,

where, being intermixed with different Sorts of Flowers, they will make a beautiful Appearance.

This Plant is not naturally of long Duration, but by taking them up in Autumn, and parting them, they may be continued several Years, but as the seedling Plants always flower much stronger than the Offsets, few Persons ever propagate them by Slips.

The Sort with white Flowers will frequently arise from the Seeds of the blue, as will also that with variegated Flowers, but these may be continued by parting their Roots.

The variegated Kind is preserved by parting their Roots, because the Plants raised from Seeds would be subject to degenerate, and become plain. The best Time to part them is about *Michaelmas*, that they may take good Root before the cold Weather prevents them. These should have a fresh light Soil, but if it be too rich, their Roots will rot in Winter, or the Stripes will go off in the Summer.

The 2d Sort grows naturally in *Virginia* and other Parts of *North America*. This hath creeping Roots, by which it multiplies very fast. The Leaves have seldom more than 3 or 4 Pair of Lobes, which stand at a much greater Distance from each other than those of the common Sort; they are of a darker green. The Lobes are narrow, and are placed alternately; the Stalks rise 9 or 10 Inches high, sending out Branches their whole Length. The Flowers are produced in loose Bunches, standing upon pretty long Foot Stalks; they are smaller than those of the common Sort, and are of a lighter blue Colour.

This Sort may be propagated by Seeds as the common Sort, or by parting their Roots in Autumn, and is equally hardy with the common Sort.

POLIANTHES. *Lin. Gen. Plant.* 384. *Hyacinthus*. *Tourn. Inst. R. H.* 344. *Tab.* 180. The Tuberose.

The Characters are,

The Flower has no Emplacement; it has one Petal which is Funnel-shaped. The Tube is oblong and incurved; the Brim is cut into six oval Segments which spread open. It hath six thick Stamina situated in the Chaps of the Petal, terminated by linear Summits, which are longer than the Stamina. In the Bottom of the Tube is situated a roundish Germen, supporting a slender Style crowned by a thick trifid Honey-bearing Stigma. The Germen turns to an obtuse, roundish, three-cornered Capsule having three Cells, which are filled with plain half-round Seeds disposed in a double Range.

We have but one Species of this Genus, viz.

POLIANTHES *floribus alternis*. *Hort. Cliff.* 127. *Polianthes* with Flowers placed alternately. This is the *Hyacinthus Indicus tuberosus*, flore *Narcissi*. *C. B. P.* 42. Tuberous Indian Hyacinth, with a Flower like *Narcissus*, commonly called Tuberose.

The Varieties of this are the Tuberose with a double Flower, the striped-leaved Tuberose, and the Tuberose with a smaller Flower; the last is mentioned by several Authors as a distinct Species, but is certainly a Variety. *Caspar Baubin* titles it *Hyacinthus Indicus tuberosus*, flore *Hyacinthi orientalis*. *pin.* 47. i. e. Indian tuberous Hyacinth with a Flower like the Eastern Hyacinth. This Sort is frequent in the South of *France*, from whence the Roots have been often brought to *England* early in the

the Spring, before those Roots have arrived from *Italy*, which are annually imported; the Stalks of this are weaker, and do not rise so high, and the Flowers are smaller than those of the common *Tuberoſe*, but in other Reſpects is the ſame.

The *Tuberoſe* grows naturally in *India*, from whence it was firſt brought to *Europe*, where it now thrives in the warmer Parts, as well as in its native Soil. The *Genefe* are the People who cultivate this Plant, to furniſh all the other Countries where the Roots cannot be propagated without great Trouble and Care, and from thence the Roots are annually ſent to *England*, *Holland*, and *Germany*. In moſt Parts of *Italy*, *Sicily*, and *Spain*, the Roots thrive and propagate without Care, where they are once planted.

This Plant has been long cultivated in the *Engliſh* Gardens for the exceeding Beauty and Fragrancy of its Flowers; the Roots of this are annually brought from *Genoa*, by the Perſons who import Orange Trees; for as theſe Roots are too tender to thrive in the full Ground in *England*, ſo there are few Perſons who care to take the Trouble of nurſing up their Offsets, till they become blowing Roots, becauſe it will be 2 or 3 Years before they arrive to a proper Size for producing Flowers; and as they muſt be protected from the Froſt in Winter, the Trouble and Expence of Covers is greater than the Roots are worth; for they are generally ſold reaſonable, by thoſe who import them from *Italy*.

The double flowering is a Variety of the firſt, which was obtained from the Seed by Monſ. *Le Cour*, of *Leyden* in *Holland*, who for many Years was ſo tenacious of parting with any of the Roots, even after he had propagated them in ſuch Plenty as to have more than he could plant, and cauſe them to be cut in Pieces, that he might have the Vanity to boaſt of being the only Perſon in *Europe* who was poſſeſſed of this Flower; but of late Years the Roots have been ſpread into many Parts, and as there is no other Method to propagate this but by the Offsets, moſt People who have had of this Sort are careful to multiply and increaſe it, which is done by planting the Offsets upon a moderate hot Bed early in *March*, and covering the Bed in cold Weather with Mats or Straw, and in Summer they muſt have Plenty of Water in dry Weather. In this Bed the Roots may remain till the Leaves decay in Autumn, but if there ſhould happen any Froſt before that Time, the Bed ſhould be covered to guard the Roots from the Froſt, becauſe if the Froſt enters ſo low as to reach the Roots, it will kill them: and if the Leaves are injured by the Froſt, it will weaken the Roots. Where there is due Care taken to ſcreen them from Froſt, and too much Wet, it will be the beſt Way to let the Roots remain in the Bed till the End of *November* or the Beginning of *December*, provided hard Froſts do not ſet in ſooner; for the leſs Time the Roots are out of the Ground, the ſtronger they will be, and the ſooner they will flower; when the Roots are taken up, they ſhould be cleaned from the Earth, and laid up in dry Sand, where they may be ſecure from Froſt and Wet; here they ſhould remain until the Seafon for planting them again; this Method ſhould be praſiſed by thoſe who are deſirous to cultivate the ſingle Sort in *England*, and that with ſtriped Leaves muſt be propagated the ſame Way.

I ſhall next give Directions for the Management of thoſe Roots, which are annually brought from *Italy*. And firſt, in the Choice of the Roots, thoſe which are the largeſt and plumpeſt, if they are perfectly firm and ſound, are the beſt; and the fewer Offsets they have, the ſtronger they will flower; but the under Part of the Roots ſhould be particularly examined, becauſe it is there that they firſt decay; after the Roots are choſen, before they are planted, the Offsets ſhould be taken off; for if theſe are left upon the Roots, they will draw away Part of the Nouriſhment from the old Root, whereby the Flower Stems will be greatly weakened.

As theſe Roots commonly arrive in *England* in the Month of *February* or *March*, thoſe who are deſirous to have theſe early in flower, ſhould make a moderate hot Bed ſoon after the Roots arrive, which ſhould have good rich Earth laid upon the Dung, about 7 or 8 Inches deep; this Bed ſhould be covered with a Frame, and when the Bed is in a proper Temperature for Warmth, the Roots ſhould be planted at about 6 Inches Diſtance from each other every Way. The upper Part of the Root ſhould not be buried more than one Inch in the Ground; when the Roots are planted, there ſhould be but little Water given them, until they ſhoot above Ground; for too much Wet will rot them, when they are in an inactive State, but afterward they will require Plenty of Water, eſpecially when the Seafon is warm. When the Flower Stems begin to appear, the Bed ſhould have a large Share of Air given to it, otherwiſe the Stalks will draw up weak, and produce but few Flowers; for the more Air theſe Plants enjoy in good Weather, the ſtronger they will grow, and produce a greater Number of Flowers; therefore, toward the Beginning of *May*, the Frame may be quite taken off the Bed, and Hoops faſtened over it, to ſupport a Covering of Mats, which need not be laid over but in the Night, or in very cold Weather, ſo that by enjoying the free open Air, their Stems will be large; and if they are well watered in dry Weather, their Flowers will be large, and a great Number on each Stem.

This firſt Planting will require more Care than thoſe which are deſigned to come after them, for in order to have a Succeſſion of theſe Flowers, the Roots ſhould be planted at three different Times, viz. the firſt the Beginning of *March*, the ſecond the Beginning of *April*, and the third at the End of that Month, or the Beginning of *May*; but theſe Beds will require a much leſs Quantity of Dung than the firſt, eſpecially that Bed which is the laſt made; for if there is but Warmth enough to put the Roots in Motion, it is as much as will be required; and this laſt Bed will need no Covering, for many Times thoſe Roots which are planted in the full Ground at this Seafon, will produce ſtrong Flowers in Autumn; but in order to ſecure their flowering, it is always the beſt Way to plant them on a gentle hot Bed. As to the ſecond Bed, that ſhould be arched over with Hoops, and covered with Mats every Night, and in bad Weather, otherwiſe the late Froſts which frequently happen in *May*, will pinch them.

Theſe Plants may remain in the Beds until the Flowers are near expanding, at which Time they may be carefully taken up, preſerving the Earth to their Roots, and planted in Pots, and then placed in the Shade for

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about a Week to recover their Removal; after which Time the Pots may be removed into Halls or other Apartments, where they will continue in Beauty a long Time, and their fragrant Odour will perfume the Air of the Rooms where they are placed; and by having a Succession of them, they may be continued from Midsummer to the End of October, or Middle of November; but as the Stems of these Plants advance, there should be a Stick put down by each Root, to which the Stem should be fastened, to prevent its being broken by the Wind.

It is a common Practice with many, to plant these Roots in Pots, and plunge the Pots into a hot Bed; but there is much more Trouble in raising them in this Method, than in that before directed; for if the Roots are not planted in very small Pots, there will be a Necessity of making the Beds much larger, in order to contain a Quantity of the Roots; and if they are first planted in small Pots, they should be shaken out of these into Pots of a larger Size, when they begin to shoot out their Flower Stems, otherwise the Stalks will be weak, and produce but few Flowers; therefore I prefer the other Method, as there is no Danger in removing the Roots, if it is done with Care.

When the Roots are strong and properly managed, the Stems will rise 3 or 4 Feet high, and each Stem will produce 20 Flowers or more; in this the great Beauty of these Flowers consists, for when there are but a few Flowers upon the Stalks, they soon fade away, and must be frequently renewed; for the Flowers are produced in Spikes coming out alternately upon the Stalk, the lower Flowers opening first; and as these decay, those above them open, so that in Proportion to the Number of Flowers upon each Stalk, they continue in Beauty a longer or shorter Time.

The Sort with double Flowers will require a little more Care, in order to have the Flowers fair; but this Care is chiefly at the Time of blowing, for the Flowers of this Sort will not open, if they are exposed to the open Air; therefore when the Flowers are fully formed and near opening, the Pots should be placed in an airy Glass Case, or a Shelter of Glasses should be prepared for them, that the Dews and Rains may not fall upon them; for that will cause the Flowers to rot away before they open, and the Heat of the Sun drawn through the Glasses will cause their Flowers to expand very fair. With this Management, I have had this Sort with very double Flowers extremely fair, and upward of 20 upon one Stem, so that they have made a beautiful Appearance; but where this has not been practised, I have rarely seen one of them in any Beauty.

POLIUM. Tourn. *Infl. R. H.* 206. *Tab.* 97. *Tournefortium*. *Lin. Gen. Plant.* 625. Mountain Poley.

The Characters are,

The Empalement of the Flower is permanent, of one Leaf, cut into 5 acute Segments. The Flower is of the Lip Kind; in both one Petal, with a short Tube. The Stamina occupy the Place of the upper Lip, and the lower Lip is cut into 5 Segments. It hath 4 Awl-shaped Stamina, which are terminated by small Summits, and a Germen divided into 4 Parts, supporting a slender Style, crowned by 2 narrow Stigmas; the Germen becomes 4 naked Seeds, inclosed in the Empalement.

The Species are,

1. *POLIUM foliis lanceolatis integerrimis, caulibus procumbentibus, floribus corymbosis terminalibus*. Mountain Poley with entire Spear-shaped Leaves, trailing Stalks, and Flowers growing in a Corymbus at the End of the Branches. This is the *Polium lavendulae folio*. C. B. P. 220. Mountain Poley with a Lavender Leaf.

2. *POLIUM spicis oblongis foliis obtusis crenatis tomentosis*. Mountain Poley with oblong Spikes of Flowers, and obtuse, crenated, woolly Leaves. This is the *Polium montanum luteum*. C. B. Yellow Mountain Poley.

3. *POLIUM spicis subrotundis, caulibus suffruticosis incanis, foliis linearibus tomentosis*. Mountain Poley with roundish Spikes of Flowers, hoary shrubby Stalks, and very narrow woolly Leaves. *Polium luteum angustifolium*. C. B. P. Narrow-leaved yellow Mountain Poley.

4. *POLIUM caule ramoso procumbente, foliis lineari-lanceolatis dentatis, floribus corymbosis terminalibus*. Poley with a branching trailing Stalk, narrow, Spear-shaped, woolly, indented Leaves, and Flowers growing in a Corymbus terminating the Branches. This is the *Polium montanum album*. C. B. P. 221. White Mountain Poley.

5. *POLIUM caule erecto diffuso, foliis lineari-lanceolatis crenatis, corymbis terminalibus lateralibusque*. Poley with an erect diffused Stalk, narrow, Spear-shaped, crenated Leaves, and Flowers growing in a Corymbus, terminating and proceeding out of the Sides of the Branches. This is the *Polium maritimum erectum Montpellieracum*. C. B. P. 221. Upright maritime Poley of Montpellier.

6. *POLIUM caulibus procumbentibus bisutissimis, foliis cuneiformi-orbiculatis crenatis*. Poley with very hairy trailing Stalks, and orbicular Wedge-shaped Leaves, which are crenated. This is the *Polium Pyrenaicum supinum, hederæ terrestris folio* Tourn. *Infl.* 206. Low Pyrenean Poley, with a Leaf like that of Ground-ivy.

7. *POLIUM caule erecto ramoso, foliis lanceolatis dentatis subtus tomentosis, floribus confertis terminalibus*. Poley with an upright branching Stalk, Spear-shaped indented Leaves, which are woolly on their under Side, and Flowers growing in Clusters terminating the Branches. This is the *Polium montanum album serratum, latifolium, erectum majus*. Barrel. *Obs.* 34. Greater upright white Mountain Poley, with a broad sawed Leaf.

8. *POLIUM caule erecto corymboso, foliis linearibus reflexis, floribus terminalibus*. Poley with an upright Stalk branching out in Form of a Corymbus, narrow reflexed Leaves, and Flowers terminating the Stalks. This is the *Polium montanum album angustifolium*. C. B. P. 221. Narrow-leaved white Mountain Poley.

9. *POLIUM caule ramoso, procumbente, foliis lineari-lanceolatis superne dentatis, spicis oblongis terminalibus*. Poley with a trailing branching Stalk, narrow Spear-shaped Leaves which are indented toward the Top, and oblong Spikes of Flowers terminating the Stalks. This is the *Polium Hispanicum supinum, flore flavescente* Tourn. *Infl.* 207. Low Spanish Poley with a yellowish Flower.

10. *POLIUM caule erecto suffruticoso, foliis linearibus confertis, spicis cylindricis fastigiatis terminalibus*. Poley with an upright under Shrub Stalk, narrow Leaves growing in Clusters, and cylindrical Spikes of Flowers growing in Bunches, which terminate the Stalks. *Polium erectum album, angustiori folio & spica*. Pbil. *Transf.* 417. Upright white Poley with a narrower Leaf and Spike.

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11. *POLIUM caule erecto fruticoso, foliis lanceolatis tomentosis integerrimis, corymbis terminalibus.* Poley with an upright shrubby Stalk, Spear-shaped woolly Leaves which are entire, and Flowers growing in a Corymbus terminating the Stalks. *Polium Valentinum fruticosum, angustifolium, flore albo.* Barr. Icon. 1048. Shrubby narrow-leaved Poley of *Valentia*, with a white Flower.

12. *POLIUM caule procumbente, foliis linearibus serratis, corymbis confertis terminalibus.* Poley with a trailing Stalk, narrow sawed Leaves, and clustered Flowers growing in a Corymbus, at the Ends of the Stalks. This is the *Polium montanum album, angustifolium serratum, supinum minus.* Barrel. Icon. 1091. Low, smaller, white Mountain Poley, with a narrow sawed Leaf.

13. *POLIUM caule diffuso procumbente, foliis linearibus dentatis tomentosis, spicis subrotundis.* Poley with a trailing diffused Stalk, narrow indented woolly Leaves, and roundish Spikes of Flowers. This is the *Polium montanum luteum, serratis angustioribus incanis foliis.* Barrel. Icon. 1089. Yellow Mountain Poley, with narrower, hoary, sawed Leaves.

14. *POLIUM caule erecto suffruticoso, foliis lanceolatis integerrimis, corymbis confertis terminalibus.* Poley with an erect shrubby Stalk, Spear-shaped entire Leaves, and clustered Flowers growing in a Corymbus at the Ends of the Branches.

15. *POLIUM caule diffuso, foliis linearibus pinnato-dentatis, spicis subrotundis lateralibus.* Poley with a diffused Stalk, linear, winged, indented Leaves, and roundish Spikes of Flowers proceeding from the Sides of the Stalks. *Polium Smyrnaeum scordii folio.* Tourn. Cor. 14. Poley of *Smyrna*, with a Water Germander Leaf.

The 1st Sort grows naturally on the Mountains about *Basil* and *Geneva*, as also in *France*. The Root of this Plant is composed of many ligneous Fibres, which spread wide in the Ground, from which arise several weak, trailing, ligneous Stalks, 8 or 9 Inches long, which spread on every Side, and send out many small Branches, garnished with small Spear-shaped Leaves, of a deep green and entire; they are placed by Pairs. The Flowers are produced in a Corymbus at the End of the Branches, they are white, and shaped like those of the other Species. These appear in *June* and *July*, but are seldom succeeded by Seeds in *England*. There is another Sort with much smaller Leaves, which are hoary on their under Side, but I am not certain if it is a distinct Species.

The 2d Sort grows naturally in *Spain*; the Stalks of this are rather herbaceous, and trail upon the Ground; they are about six Inches long, hoary, and garnished with woolly Leaves, about half an Inch long; some of them are Wedge-shaped, others are oblong, ending in obtuse Points, they are crenated toward their Ends. The Flowers are collected in oblong thick Spikes at the End of the Branches, they are of a deep yellow Colour, and appear the Beginning of *June*, but are seldom succeeded by Seeds in this Country.

The 3d Sort grows naturally in *Spain* and *Portugal*; the Stalks of this are ligneous, erect, and branching, covered with a hoary Down; they rise 6 or 8 Inches high, and are garnished with linear Leaves about Half an Inch long; they are woolly, and have sometimes 2 or 3 slight Indentures on their Edges. The Flowers

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are collected in roundish Spikes at the End of the Branches, they are of a bright yellow, and have woolly Em-palements. These appear in *June* and *July*.

The 4th Sort grows naturally in the South of *France* and in *Italy*; this hath a trailing branching Stalk, which at the Bottom is ligneous, but the Branches are herbaceous and woolly; they are garnished with linear, Spear-shaped, woolly Leaves, indented on their Edges. The Flowers are produced in a Corymbus at the End of the Branches, they are small, white, and shaped like the other Species. This flowers in *June* and *July*.

The 5th Sort grows naturally near the Sea, in the South of *France* and in *Italy*. This hath an erect branching Stalk, which rises a Foot high; the lower Part becomes ligneous, but the upper is herbaceous; the Leaves are linear, Spear-shaped, about an Inch long, crenated on their Edges, of a thick Consistence, and a little woolly. The Flowers are collected in a Corymbus at the End of the Branches, they are white like the other Species, and appear in *July* and *August*.

The 6th Sort grows naturally on the *Pyrenean* Mountains; this hath slender shrubby Stalks, which trail close upon the Ground; they have a purple Bark, and covered with white Hairs; the Leaves are round at the Top, but at their Base are contracted in Form of a Wedge, and are crenated on their Edges, so as to resemble at first Sight the Leaves of Ground-ivy, but they are hairy, and of a thicker Consistence. The Flowers are collected in round Bunches at the End of the Branches, one Half of their Petals are purple, and the other Half white; they are larger than those of the other Species, but are of the same Form. It flowers great Part of Summer, but seldom produces Seeds here.

The 7th Sort grows naturally in *Italy* and *Spain*; this hath a ligneous, erect, branching Stalk, which rises near a Foot high; it is very hoary, and branches out toward the Top; the Leaves are Spear-shaped, indented on their Edges, and woolly on their under Side. The Flowers are white, small, and grow in Clusters at the End of the Branches. It flowers in *June* and *July*.

The 8th Sort grows naturally in *Spain* and *Italy*; this rises with a shrubby Stalk 9 or 10 Inches high, branching out toward the Top in Form of a Corymbus; the Leaves are linear, and their Edges reflexed. The Flowers are collected in roundish woolly Heads at the End of the Branches, they are white, and smaller than most of the other Species. It flowers in *June* and *July*.

The 9th Sort grows naturally in *Spain*; it hath a trailing branching Stalk about 6 or 8 Inches long, which is ligneous at Bottom, but upward is herbaceous and hoary; the Leaves are linear, Spear-shaped, and indented toward the Ends. The Flowers are collected in oblong Spikes at the End of the Branches, they are of a pale yellow Colour, and shaped like those of the other Species. This flowers great Part of Summer.

The 10th Sort grows naturally in *Sicily*; this hath slender shrubby Stalks, which rise a Foot and a Half high; they are smooth and white, sending out a few short Branches toward the Top, and are garnished with small linear Leaves growing in Clusters. The Flowers are collected in long cylindrical Spikes, which stand in Bunches at the Top of the Stalks, and sometimes come

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POLYGALA, Virginiana foliis oblongis floribus in thyrsis candidis radice Alexipharmica

Senegan. Rattle Snake Root



place this at Polygala

out in Bunches on the Sides, these are small and white. It flowers in *July* and *August*.

The 11th Sort grows naturally in *Valencia*; this hath slender ligneous Stalks near 2 Feet high, which are hoary, and garnished with small Spear-shaped entire Leaves at Intervals, standing in Clusters; they are woolly, and sit close to the Stalk; the upper Part of the Stalk divides into several slender Foot Stalks, each sustaining a small Corymbus of white Flowers. The whole Plant is very hoary, and has a strong aromack Odour; it flowers late in Summer.

The 12th Sort grows naturally in the South of *France* and in *Italy*; this hath trailing ligneous Stalks about a Foot long, garnished with linear sawed Leaves, which are hoary, and have smaller Leaves coming out from the Bosom of the other. The Flowers are collected in a Corymbus at the End of the Branches, they are small and white. This flowers in *June* and *July*.

The 13th Sort grows naturally in *Spain* and *Italy*; this hath diffused trailing Stalks, very woolly, about six or seven Inches long, garnished with narrow indented Leaves, covered with a woolly Down, and terminated by roundish Heads of yellow Flowers; the whole Plant is very hoary. It flowers in *July*.

The 14th Sort grows naturally in *Spain*; this hath erect branching Stalks about 6 or 8 Inches high; the Branches come out opposite the whole Length of the Stalk, they are garnished with small Spear-shaped Leaves of a dark green Colour on their upper Side, but hoary on their under; the Stalks and Branches are terminated by Clusters of blue Flowers, which are collected in roundish Heads. This Sort flowers in *July* and *August*.

The 15th Sort grows naturally about *Smyrna*; this hath diffused Stalks, which rise about a Foot high; they are white, and closely garnished with linear Leaves near 2 Inches long, and about a Quarter of an Inch broad; they are indented regularly on their Edges like those of Spleenwort, but the Indentures are not deep; they are of a dark green on their upper Side, but hoary on their under. The Flowers terminate the Branches, in roundish Spikes, and also come out from their Side; they are white, and shaped like those of the other Species. It flowers in *July* and *August*.

There are several other Species of this Genus, which grow naturally in the warmer Parts of *Europe*; but those here mentioned, are all that I have yet seen growing in the *English* Gardens.

All the Sorts, except the first, are abiding Plants; they may be propagated by Seeds, which must be procured from the Countries where they naturally grow, because they seldom perfect their Seeds in *England*. These should be sown upon a Bed of fresh light Earth in Spring, and when the Plants come up, they must be carefully kept clean from Weeds; about the Middle of *July* they will be fit to remove, when they may be carefully taken up, and Part of them planted on a warm Border of dry rubbishy Soil, observing to shade them from the Sun, and water them till they have taken new Root, after which they will require no other Culture, but to keep them clean from Weeds. My advising these and many other aromack Plants, which are Natives of the warmer Parts of *Europe*, to be planted in Rubbish, is founded upon long Experience of their abiding

much longer, and resisting the Cold of our Winters much better, than when they are growing in better Ground, where they grow much freer, are fuller of Moisture, and therefore more liable to be killed by Frost.

The remaining Plants may be planted in small Pots, filled with fresh, light, undunged Earth, and placed in the Shade till they have taken new Root; then they may be removed into an open Situation, to remain till the Beginning of *November*, when they should be placed under a common Frame, to secure them from the Frost in Winter, which sometimes destroys them, by this Method the Species may be preserved.

These Plants may be disposed in a Garden, so as to afford Pleasure, by mixing them with *Marum*, *Mastich*, and several other aromack Plants, upon the sloping Sides of Banks, which are exposed to the Sun, or upon little Hillocks raised in a sheltered Situation, where, by the Diversity of their hoary Branches, being of various Shapes, they will make a pretty Appearance; and in such Places they will resist the Cold much better, than when they are planted in a good Soil.

They may also be propagated by Cuttings or Slips, which should be planted the Beginning of *April*, just before they shoot; upon a Border exposed to the East; and if the Season proves dry, they must be watered and shaded until they have taken Root, and afterward they will require no other Care but to keep them clean from Weeds, and at *Michaelmas* the Plants should be removed where they are designed to remain; but it will be proper to put a Plant of each Sort in Pots, that they may be sheltered in Winter, to preserve the Kinds.

The 4th and 5th Sorts are sometimes used in Medicine.

POLYANTHUS. See *Primula*.

POLYGALA. *Tourn. Inst. R. H.* 174. *Tab.* 79. *Lin. Gen. Plant.* 761. [so called, of *μαλα*, much, and *γαλα*, Milk, because if Cattle are fed in Marshes that produce this Plant, they give a great Quantity of Milk:] Milkwort.

The Characters are,

The Flower has a small permanent Empalement of 3 Leaves, which are oval and acute; 2 of these are below the Petals, and one is above. The Flower is shaped like those of the Butterfly Kind, the Number of Petals is indeterminate. The Wings are large, plain, and extend beyond the other Petals; the Standard is tubulous, short, and reflexed at the Brim, where it is bifid. The Keel is concave, compressed, and bellied toward the Top. It hath 8 Stamens in 2 Bodies, included in the Keel, terminated by single Summits; and an oblong Germen supporting an erect Style, terminated by a thick, bifid Stigma. The Germen becomes a Heart-shaped Capsule having 2 Cells, each containing one Seed.

The Species are,

1. POLYGALA floribus cristatis racemosis, caulibus herbaceis simplicibus procumbentibus, foliis lineari-lanceolatis. *Amæn. Acad.* 2. p. 136. Milkwort with branching crested Flowers, single, trailing, herbaceous Stalks, and linear Spear-shaped Leaves. This is the *Polygala vulgaris*. *C. B. P.* 215. Common Milkwort.

2. POLYGALA floribus cristatis racemosis, caule erecto foliis lanceolato-linearibus acutis. *Sauv. Monst.* 53. Milk-

wort with branching crested Flowers, an erect Stalk, and acute, Spear-shaped, linear Leaves. This is the *Polygala vulgaris coloris obsoleti, foliis angustissimis*. 7. B. 3. p. 338. Common Milkwort with a worn-out Flower, and the narrowest Leaves.

3. *POLYGALA floribus cristatis, carinâ lunulata, caule fruticoso, foliis laevibus oblongis obtusis*. Amæn. Acad. 2. p. 138. Milkwort with crested Flowers, a Moon-shaped Keel, and a shrubby Stalk bearing oblong Leaves, which end in obtuse Points. This is the *Polygala frutescens, folio buxi, flore maximo*. Tourn. Inst. 175. Shrubby Milkwort, with a Box Tree Leaf and a large Flower.

4. *POLYGALA floribus imberbibus sparsis, carinæ apice subrotundo, caule fruticoso, foliis lanceolatis*. Amæn. Acad. 2. p. 140. Milkwort with Flowers growing thinly and without Beards, the Point of the Keel roundish, a shrubby Stalk, and Spear-shaped Leaves. This is the *Chamaebuxus flore coluteæ*. C. B. P. 471. Low Box with a Flower like Bladder Sena.

5. *POLYGALA floribus imberbibus spicatis, caule erecto herbaceo simplicissimo, foliis lato-lanceolatis*. Amæn. Acad. Milkwort with spiked Flowers having no Beards, an erect, single, herbaceous Stalk, and broad Spear-shaped Leaves. This is the *Polygala Virginiana, foliis oblongis, floribus in thyrsis candidis, radice alexipharmica*. Edit. Prior. Milkwort of Virginia with oblong Leaves, white Flowers ranged in a loose Spike, and an alexipharmick Root, commonly called Senega Rattle Snakewort.

6. *POLYGALA floribus imberbibus, oblongo capitatis, caule erecto ramoso, foliis linearibus*. Milkwort with beardless Flowers growing in oblong Heads, an erect branching Stalk, and linear Leaves. This is the *Polygala Mariana, angustiori folio, flore purpureo*. Pluk. Mantiss. 153. Tab. 438. fig. 5. Maryland Milkwort with a narrower Leaf and a purple Flower.

7. *POLYGALA floribus cristatis, racemo terminali, caule erecto ramoso, foliis lanceolatis tomentosis*. Milkwort with crested Flowers, an erect branching Stalk, terminated by a loose Spike of Flowers, and woolly Spear-shaped Leaves. This is the *Polygala Americana erecta, flore purpureo-cæruleo, folio molli incano*. Flouss. Mss. Upright American Milkwort, with a purplish blue Flower, and a soft hoary Leaf.

There are several other Species of this Genus, some of which grow naturally in Europe, and others in America, but as they are seldom cultivated in Gardens, so it would be to little Purpose to enumerate them here.

The 1st Sort grows naturally in Pastures and upon Heaths in England; of this there are three Varieties, one with a blue, another with a purple, and a third with white Flowers, which are frequently found intermixed; and there is another which is larger, and is supposed to be a distinct Species; but I rather believe this Difference is owing to the Soil in which they grow; for the large one is generally found growing in moist Pastures, and the small one upon dry Heaths. This hath a perennial Root, from which come out 3 or 4 slender, trailing, herbaceous Stalks, about six Inches long, garnished with linear Spear-shaped Leaves, about half an Inch long, and an eighth Part of an Inch broad in the Middle, terminating in Points, at

both Ends. The Flowers are produced at the Top of the Stalks, branching out; they are small, and of a blue, purple, or white Colour, having two Wings, a Keel and Standard like the Butterfly Flowers. These appear in June, and are succeeded by flattish Heart-shaped Capsules, dividing into 2 Cells, each containing one Seed.

The 2d Sort grows naturally upon sterile Ground about Mountpelier; this Sort is annual, it rises with an upright Stalk about six Inches high, which is garnished with narrow Leaves placed alternate, ending in acute Points. The Flowers are small, of a worn-out purple Colour; the Keel is bearded like the common Sort. This flowers in July, and has Seed Vessels like the first Sort, but smaller; the Seeds ripen in Autumn.

These Sorts are very rarely admitted into Gardens, nor do they thrive so well when sown or transplanted there, as in their natural Situation. If these are cultivated, their Seeds should be sown soon after they are ripe, otherwise they rarely grow.

The 3d Sort grows naturally at the Cape of Good Hope; this hath a shrubby Stalk, covered with a smooth brown Bark, which rises 4 or 5 Feet high, sending out several spreading Branches toward the Top, which are closely garnished with oblong, blunt-pointed, smooth Leaves, about an Inch long, and a Quarter of an Inch broad, of a lucid green, sitting close to the Branches. The Flowers are produced at the End of the Branches, they are large, white on their Outside, but of a bright purple within; the Keel of the Flower is hollowed like a Halfmoon, and is bearded; the Wings are expanded wide, and the Standard is incurved; this Plant continueth flowering most Part of Summer. The Flowers are succeeded by compressed Heart-shaped Seed Vessels having two Cells, each containing one hard, smooth, shining Seed. This Plant is propagated by Seeds, which should be sown in small Pots, filled with light loamy Earth, soon after they are ripe; these Pots may be placed where they may have the Morning Sun only till October, when they should be placed under a hot Bed Frame, and plunged into old Tanners Bark which has lost its Heat, where they may be defended from Frost during the Winter, and in Spring the Pots should be plunged into a moderate hot Bed, which will bring up the Plants. When these appear, they should not be too tenderly treated, but must have a large Share of free Air admitted, and when they are fit to transplant, they should be carefully shaken out of the Pots, and separated, planting each into a small Pot filled with soft loamy Earth; and plunged into a very moderate hot Bed to forward their taking new Root, observing to shade them from the Sun, and gently refresh them with Water as they may require it, but they must not have too much Wet. When they are rooted, they must be gradually inured to bear the open Air, and in June they may be placed abroad in a sheltered Situation, where they may remain till the Middle or latter End of October, according as the Season proves favourable; then they must be removed into the Green-house, and treated as Orange Trees, being careful not to give them too much Wet during the Winter Season. In the Summer they must be placed abroad with other Green-house Plants, where, by their long Continuance in flower, they will

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will make a fine Appearance. The Management of this Plant is nearly the same as for the Orange Tree.

The 4th Sort grows naturally on the *Alps*, and upon the Mountains in *Austria* and *Hungary*; this rises with a slender, branching, ligneous Stalk about a Foot high, when it grows upon good Ground, but on a rocky Soil seldom more than Half that Height. The Branches are closely garnished with stiff, smooth Spear-shaped Leaves of a lucid green. From between the Leaves, toward the Top of the Branches, the Flowers come out upon very short Foot Stalks; they are white on their Outside, but within are of a purplish Colour mixed with yellow, and have a grateful Odour. These appear in *May*, and are succeeded by Seed Vessels shaped like those of the former Sort.

This Plant is very difficult to cultivate in Gardens, for it commonly grows out of the Fissures of Rocks, so cannot be easily transplanted, and the Seeds are with Difficulty obtained from Abroad; nor do these vegetate till they have been a whole Year in the Ground, and when the Plants come up, they make very little Progress here, being very difficult to transplant, which occasions its present Scarcity in *England*.

The best Method of cultivating this is by Seeds, which should be procured as fresh as possible from the Places of its natural Growth, and sown in Pots as soon as it arrives; these Pots may be plunged into the Ground, where they may have only the Morning Sun. If these are sown before *Christmas*, there will be a Chance of the Plants coming up the following Spring, but those, which are not sown till toward Spring, will remain in the Ground a Year; therefore the Pots should be plunged into the Ground, where they may have but little Sun the following Summer, and in Autumn they may be removed, and plunged into an old Tan Bed under a hot Bed Frame, where they may be protected from severe Frost; for although this Plant is a Native of the *Alps* and other Cold Mountains, yet as the Seeds will not be covered with Snow here, as they are in their native Soil and Situation, the Seeds are frequently spoiled here by the Inconstancy of the Weather in *England*. When the Plants come up, they should be placed in Shade during Summer, and in Autumn they may be turned out of the Pots, and planted in a Border where they may have only the Morning Sun, for this Plant will not thrive long in Pots. If the Winter proves very severe, it will be proper to cover the Surface of the Ground about their Roots with Mulch to keep out the Frost. If the Plants take Root in the Border, they should remain there undisturbed, and be only kept clean from Weeds, for the Ground about their Roots should not be dug or dunged.

The 5th Sort grows naturally in most Parts of *North America*. This hath a perennial Root composed of several fleshy Fibres, from which arise 3 or 4 branching Stalks, which grow erect, and are more than a Foot high; these are garnished with Spear-shaped Leaves placed alternately. The Flowers are produced in loose Spikes at the End of the Branches; they are small, white, and shaped like those of the common Sort, but their Keels have no Beards. It flowers here in *July*, but the Plants do not produce Seeds here.

The Root of this Sort has been long used by the *Se-*

neka Indians to cure the Bite of the Rattle-Snake, which, if taken in Time, is an infallible Remedy. And of late it hath been used by the Inhabitants of *Virginia* in many Disorders which are occasioned by a thick sizy Blood; so that the Root of this Plant, when its Virtues are fully known, may become one of the most useful Medicines yet discovered. The *Seneca Indians* powder this Root, and generally carry it about them when they travel in the Woods, lest they should be bit by the Rattle-snake; and whenever this happens, they take a Quantity of the Powder inwardly, and apply some of it to the Part bitten, which is a sure Remedy.

The 6th Sort grows naturally in *Maryland*; this hath a perennial Root, from which arise two or three Stalks about 8 Inches high, which divide into several erect Branches, garnished with small linear Leaves of a dark green Colour. The Flowers are collected into oblong Heads at the Ends of the Stalks; they are small, and of a purplish blue Colour.

Both these Sorts are difficult to obtain, for the Seeds rarely succeed, so the best Way is to procure their Roots from *America*, and when they arrive, plant them in a Bed of light Earth in a sheltered Situation. In Summer they must be kept clean from Weeds, and if the Surface of the Ground about their Roots is covered with old Tanners Bark, or any other Kind of Mulch in Winter, to keep out the Frost, it will be a secure Method to preserve them.

The 7th Sort was discovered by Dr. *Houfoun* at *La Vera Cruz*; this hath a taper perennial Root which runs deep in the Ground, from which arise several slender branching Stalks about 6 or 7 Inches high, garnished with downy Spear-shaped Leaves an Inch long, and half an Inch broad in the Middle, drawing to a point at both Ends. The Flowers are produced in loose Spikes at the End of the Branches; they are larger than the common Sort, and of a bluish purple Colour. The Keel of the Flower is bearded, as in the common Sort.

This is too tender to live in the open Air in *England*, and it is one of those Plants which will not thrive in Pots, so is difficult to preserve here. It is propagated by Seeds, which must be procured from Abroad. The Seeds, which I received from Dr. *Houfoun*, remained a Year in the Ground before the Plants appeared, and the Plants lived one Year; but when their Roots reached the Bottom of the Pots, they decayed, and those, which were transplanted into larger Pots, did not survive their Removal, though it was performed with great Care.

POLYGONATUM. See *Convallaria*.

POLYODIUM. *Tourn. Inst. R. H. 540. Tab. 316. Lin. Gen. Plant.* [of ~~many~~ many, and ~~one~~ a Foot, *q. d.* many Feet. This Kind of Plant strikes its Roots into every Part it can lay hold of, whether it be Stone, Earth, or Tree, it is the same Thing, especially if it be a Tree of the Oak Kind.] Polypody.

The Characters are,

This is one of the Fern Tribe, which is distinguished from the others, by the Fructification being in roundish Spots distributed on the under Surface of the Leaf.

The Species are,

1. POLYODIUM frondibus pinnatifidis, pinnis oblongis subserratis obtusis, radice squammatâ *Lin. Sp. Plant. 1085.* Polypody with Wing-pointed Leaves having oblong obtuse

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Lobes which are somewhat sawed, and a scaly Root. *Polypodium vulgare* C. B. P. 359. Common Polypody.

2. *POLYPODIUM frondibus pinnatifidis, pinnis lanceolatis lacero-pinnatifidis serratis.* Lin. Sp. Plant. 1086. Polypody with wing-pointed Leaves, whose Lobes are Spear-shaped, and the Jags wing-pointed and sawed. *Polypodium Cambro-Britannicum, pinnulis ad margines laciniatis.* Raii Syn. Welsh Polypody with jagged Leaves.

There are several other Species of this Plant which are Natives of America, some of which are preserved in curious Botanick Gardens for Variety; but as they are rarely cultivated in other Gardens, it is not worth while to enumerate them in this Place.

The 1st Sort is that used in Medicine, and is found growing on old Walls and shady Banks in divers Parts of England. The 2d Sort was brought from Wales, where it grows in great Plenty, and is the most beautiful of all the Sorts. These Plants may be propagated by parting their Roots in Spring before they shoot, and should be planted in a very poor moist Soil under the Shade of a Wall; for if they are exposed to the Sun, they will not thrive. They chiefly delight to grow out of the Joints of Walls and old Buildings, but are commonly found exposed to the North.

POMGRANATE. See Punica.

POMUM ADAMI. See Aurantium.

PONTERDERIA. Lin. Gen. Plant. 361 *Michelia*. Houst. Mff.

The Characters are,

The Flowers are included in an oblong Sheath, which opens on one Side; it hath 6 Petals which are divided; the three upper are erect, and form a Kind of Lip; the three under are reflexed. It hath 6 Stamina which are inserted to the Petals; the three, which are longest, are fastened to the Mouth of the Tube; the other are inserted in the Base; they are terminated by prostrate Summits. Under the Petals is situated an oblong Germen, supporting a single Style which declines, and is crowned by a single Stigma. The Germen turns to a soft Fruit divided into six Cells, each containing several small roundish Seeds.

The Species are,

1. *PONTERDERIA foliis hastato-cordatis, floribus spicatis.* Pontederia with Spear-pointed Heart shaped Leaves, and spiked Flowers. This is the *Sagittæ similis planta palustris Virginiana, spica florum carulea.* Mor. Hist. 3. p. 618. Virginian, marsh, Plant-like Arrow-head, and having a Spike of blue Flowers.

2. *PONTERDERIA foliis hastatis, floribus umbellatis.* Lin. Sp. P. 288. Pontederia with Spear-pointed Leaves, and Flowers growing in Umbels. This is the *Sagittaria quodammodo similis planta Maderaspatana, floribus medio caule quæsi ex utriculo prodeuntibus.* Pluc. Phyt. Tab. 220. A Plant from Madras somewhat like Arrow-head, with Flowers proceeding from the Middle of the Stalk.

The 1st Sort grows naturally in marshy Places in Virginia, and most Parts of North America, and the late Dr. Housoun found it growing plentifully at La Vera Cruz. This hath a perennial Root from which arise two or three herbaceous thick Stalks a Foot high, each having one Arrow-pointed Heart-shaped Leaf about 5 Inches long and 2 and a Half broad, of a pretty thick Consistence. The Base is deeply indented, and the two Fars are rounded; the Foot Stalk of the Leaf closely

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embraces the Stalk like a Sheath for near 3 Inches in Length; above this is another Sheath which incloses the Spike of Flowers; this opens on one Side, and the Stalk rises near 2 Inches above it, where the Spikes of Flowers begin. The Spikes are about 3 Inches long; the Flowers are blue, sit very close together, and have the Appearance of Lip Flowers. These appear in June, but are not succeeded by Seeds in England.

As this Plant grows naturally on moist boggy Places, it is very difficult to be preserved in England, nor does the Plant arise from Seeds here, for I have sowed the Seeds in various Situations, and managed them different, but could never get up any of the Plants; but I had 3 or 4 of the Plants sent me, inclosed in large Clods of Earth from New England, which I planted in Pots, covering them with Mols, and constantly supplied them with Water. With this Management two of them flowered, but the following Winter destroyed them, as they were not put under Shelter; so that to preserve them, they should be placed under a hot Bed Frame in Winter, where they may be exposed to the open Air at all Times when the Weather is mild.

The 2d Sort grows naturally about Madras in watery Places. This rises with a single Stalk 8 or 9 Inches high, having one Arrow-pointed Leaf, whose Base embraces the Stalk like a Sheath, and from the open Side of the Sheath comes out the Flowers, which are at first inclosed in another smaller Sheath; these grow in a small Kind of Umbel; they are composed of six acute-pointed Petals which spread open. Each Flower stands upon a slender Foot Stalk about an Inch long; the Foot Stalk of the Leaf rises a considerable Height above the Flowers, so that they appear to come out from the Middle of the Stalk.

This Sort is much more difficult to preserve in England, because it grows naturally in a hot Country, and in Places flowed with Water. There was formerly one of these Plants brought over to Charles DuBoise Esq; at Mitcham, but it was not long-lived here.

POPULAGO. See Caltha.

POPULUS, Tourn. Inst. R. H. 592. Tab 365. Lin. Gen. Plant. 996. The Poplar Tree; in French, Peuplier.

The Characters are,

The male and female Flowers grow upon separate Trees. The male Flowers or Katkins have one oblong, loose, cylindrical Empalement, which is imbricated. Under each Scale, twice is oblong, plain, and cut on the Border, is situated a single Flower without any Petal; they have a Nectarium of one Leaf turbinated at the Bottom, and tubulous at the Top, and 8 Stamina terminated by large four-cornered Summits. The female Flowers are in Katkins like the male, but have no Stamina; they have an oval acute-pointed Germen, with scarce any Style crowned by a four-pointed Stigma. The Germen becomes an oval Capsule with two Cells, including many oval Seeds having hairy Down.

The Species are,

1. *POPULUS foliis lobatis dentatis subtus tomentosis* Poplar Tree with lobated indented Leaves which are downy on their under Side. This is the *Populus alba majoribus foliis.* C. B. P. 429. White poplar with larger Leaves, commonly called the Abele Tree.

2. *POPULUS foliis subrotundis, dentato-angulatis subtus tomentosis.* Hort. Cliff. 460. Poplar Tree with roundish

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ish Leaves, which are angularly indented, and downy on their under Side. This is the *Populus alba minoribus foliis*. Lob. Icon. 103. White Poplar with smaller Leaves.

3. *POPULUS foliis ovato-cordatis acuminatis crenatis*. Poplar Tree with oval Heart-shaped Leaves ending in acute Points which are crenated. This is the *Populus nigra*. C. B. P. 429. The black Poplar.

4. *POPULUS foliis subrotundis dentato angulatis utrinque glabris*. Hort. Cliff. 460. Poplar Tree with roundish Leaves having angular indentures, and smooth on both Sides. *Populus tremula* C. B. P. 429. The Aspen Tree.

5. *POPULUS foliis cordatis obsolete crenatis, utrinque glabris*. Poplar Tree with Heart-shaped Leaves which are somewhat crenated, and smooth on both Sides. *Populus folio maximo nunquam pilos ferens*. Boerb. C. H. P. Poplar with the largest Leaf, which is never hairy.

6. *POPULUS felix subcordatis oblongis crenatis* Hort. Cliff. 460. Poplar Tree with oblong Leaves which are crenated, and almost Heart-shaped. This is the *Populus nigra folio maximo, geminis balsamum odoratissimum fundentibus* Catefb. Car. The Carolina Poplar Tree.

7. *POPULUS foliis subcordatis, inferne incanis, supernè atroviridis*. Poplar with Leaves which are almost Heart-shaped, hoary on their under Side, and of a dark green above. This is the *Populus similis arbor resinosa altera*. C. B. P. 430. Another resinous Tree like the Poplar, commonly called *Tacamabacca*.

The 1st Sort grows naturally in the temperate Parts of Europe; this and the second Sort are frequently confounded together, but they are certainly different Species; this is commonly called *Abele* Tree here, and the second white Poplar. The Leaves of this are large, and are divided into three, four or five Lobes, which are indented on their Edges; they are of a very dark Colour on their upper Side, and very white and downy on their under, standing upon Foot Stalks which are about an Inch long. The young Branches of this Tree have a purple Bark, and are covered with a white Down, but the Bark of the Stem and older Branches are gray. In the Beginning of April the male Flowers or Katkins appear, which are cylindrical, scaly, and about three Inches long, and about a Week after come out the female Flowers on Katkins, which have no Stamina like those of the male. Soon after these come out, the male Katkins fall off, and in five or six Weeks after, the female Flowers will have ripe Seeds inclosed in a hairy Covering, when the Katkins will drop, and the Seeds will be wafted by the Winds to a great Distance.

The Leaves of the 2d Sort are rounder, and not much above half the Size of those of the first; they are indented on their Edges into Angles, and are downy on their under Side, but not so white as those of the former, nor are their upper Surfaces of so deep green. The Shoots of this are paler, the Katkins longer, and the Down of the Seeds is whiter and longer.

The Leaves of the 3d Sort are oval, Heart-shaped, and slightly crenated on their Edges; they are smooth on both Sides, and of a light green Colour. The Katkins of this are shorter than those of the two former.

The Leaves of the 4th Sort are roundish, and angularly indented; they are smooth on both Sides, and stand upon long slender Foot Stalks, so are shaken by the least Wind, from whence it was tiled the trembling

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Poplar or Aspine Tree. The Katkins of this are much like those of the first Sort, but the young Shoots are of a dark brown Colour.

The 5th Sort I saw growing in the private Garden of Dr. Boerhaave near Leyden; the Dr. told me he received it from Prussia. The Leaves are Heart-shaped; they are 6 or 7 Inches long, and 4 broad, and are slightly indented on their Edges, standing upon very short Foot Stalks. The Shoots of this Tree were very strong, and the Tree seemed as if it would grow to a great Size, but it was young when I saw it.

The 6th Sort grows naturally in Carolina, where it becomes a large Tree. The Shoots of this Sort are very strong in England, and are generally cornered; they have a light green Bark like some Sorts of the Willow. The Leaves upon young Trees, and also those upon the lower Shoots, are very large, almost Heart-shaped and crenated, but those upon the older Trees are smaller; and as the Trees advance, their bark becomes lighter, approaching to a grayish Colour. The Katkins of this Sort are like those of the black Poplar, and the Summits of the Stamina are purple.

The Shoots of this Tree while young are frequently killed down a considerable Length by the Frost in Winter, but as the Trees grow older, their Shoots are not so vigorous, and become more ligneous, so are not liable to the same Disaster; but the Trees should be planted in a sheltered Situation, for as their Leaves are very large, the Wind has great power over them, and the Branches being tender, they are frequently broken or split down by the Winds in the Summer Season, where they are much exposed.

The 7th Sort grows naturally in Canada, and in other Parts of North America; this seems to be a Tree of middling Growth, and does not spire upward but sends out many short thick Shoots on every Side, which are covered with a light brown Bark, and garnished with Leaves differing from each other in Shape and Size, most of them almost Heart-shaped, but some are oval, and others near to Spear-shaped; they are whitish on their under Side, but of a dark green on their upper. The Katkins are like those of the black Poplar, but the Number of Stamina in the male Flowers is uncertain from eighteen to twenty-two. The female Flowers I have not seen, but by the male Katkins I have been induced to place it in this Genus.

These Trees may be propagated either by Layers or Cuttings, which will readily take Root, also from Suckers, which the white Poplars send up from their Roots in great Plenty. The best Time for transplanting these Suckers is in October, when their Leaves begin to decay. These may be placed in a Nursery for 2 or 3 Years to get Strength, before they are planted out where they are designed to remain; but if you intend to propagate them from Cuttings, it is better to defer doing it until February, at which Time you may plant Truncheons of 2 or 3 Feet long, thrusting them about a Foot and a Half into the Ground. These will readily take Root, and if the Soil be moist in which they are planted, will arrive to a considerable Bulk in a few Years.

The black Poplar is not so apt to take Root from large Truncheons, therefore it is the better Method to plant Cuttings about a Foot and a Half in Length, thrusting

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thrusting them a Foot deep into the Ground; these will take Root very freely, and may be afterwad transplanted where they are to remain. This Sort will grow on any Soil, but thrives best in moist Places.

I have planted cuttings of this Tree, which in four Years have been bigger in the Trunk than a Man's Thigh, and near 20 Feet High, and this upon a very indifferent Soil; but in a very moist Soil, it is common for these Trees to shoot 8 or 10 Feet in a Season; so that where a Person hath a Mind to make a Shelter in a few Years, there is scarce any Tree so proper for that Purpose; but they should not be planted too near the Pleasure Garden, because the Katkins and Down, which fall from these Trees, will make a prodigious Litter in the Spring.

The white Sorts, as also the Aspen Tree, likewise cause a great Litter in the Spring, when their Katkins and Down fall off; and their Roots being very apt to produce a large Quantity of Suckers, but especially those Trees that came from Suckers, which render them unfit to be planted near a House or Garden; but when they are interspersed with other Trees in large Plantations, they afford an agreeable Variety, their Leaves being very white on their under Sides, which, when blown with the Wind, are turned to Sight.

A considerable Advantage may be made by planting those Trees upon moist boggy Soil, where few other Trees will thrive. Many such Places there are in England, which do not at present bring in much Money to their Owners; whereas if they were planted with these Trees, they would in a very few Years, over purchase the Ground, clear of all Expence; but there are many Persons who think nothing except Corn, worth cultivating in England; or if they plant Timber, it must be Oak, Ash, or Elm; and if their Land be not proper for either of these, it is deemed little worth; whereas if the Nature of the Soil was examined, and proper Sorts of Plants adapted to it, there might be very great Advantage made of several large Tracts of Land, which at this Time lie neglected.

The Wood of these Trees, especially of the *Abele*, is very good to lay for Floors, where it will last many Years; and for its exceeding Whiteness, is by many Persons preferred to Oak; but being of a soft Contexture, is very subject to take the Impression of Nails, &c. which renders it less proper for this Purpose: It is also very proper for wainscoting Rooms, being less subject to swell or shrink, than most other Sorts of Wood; but for Turnery Ware, there is no Wood equal to this for its exceeding Whiteness, so that Trays, Bowls, and many other Utensils, are made of it; and the Bellows-makers prefer it for their Use, as do also the Shoemakers, not only for Heels, but also for the Soles of Shoes; it is also very good to make light Carts, and the Poles are very proper to support Vines, Hops, &c. and the Lopping will afford good Fuel.

The *Carolina Poplar* may also be propagated by Cuttings or Layers; the latter is generally practised by the Nursery Gardeners, being the surest Method: and these Plants are not so full of Moisture as those raised by Cuttings, so are less liable to be cut down by the Frost when young. No Trials have been made here of the Wood of this Tree; so I cannot give any account of its Worth.

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The *Tacamabacca* sends up a great Number of Suckers from the Roots, by which it multiplies in Plenty, and every Cutting which is planted will take Root; so that when a Plant is once obtained, there may soon be Plenty of the Plants raised. The Buds of this Tree are covered with a glutinous Refin, which smells very strong, and this is the *Tacamabacca* used in the Shops.

PORRUM. Tourn. Inst. R. H. 382. Tab. 204. *Allium*. Lin. Gen. Plant. 370. Leek.

The Characters are,

The Flower hath 6 Petals, and is Bell-shaped; they are collected into a spherical Head, covered by a common roundish Spatba or Sheath, which withers. They have 6 Stamina, 3 of these are alternately broader than the other, and have forked Summits in their Middle. They have a short, round three-cornered Germen, supporting a single Style crowned by an acute Stigma. The Germen becomes a short broad Capsule with 3 Lobes having 3 Cells filled with angular Seeds.

The Species are,

1. PORRUM radice oblongâ tunicatâ, caule planifolio, floribus capitatis, flaminibus tricuspidatis. Leek with an oblong coated Root, a plain Leaf on the Stalk, Flowers collected in Heads, and three-pointed Stamina. This is the *Porrum commune capitatum* C. B. P. 72. Common headed Leek, commonly called London Leek.

2. PORRUM caule planifolio umbellifero, umbellâ globosâ flaminibus crollâ longioribus. Leek with a plain Leaf on the Stalk which supports a globular Umbel of Flowers, whose Stamina are longer than the Petals. This is the *Porrum Siberiense, floribus purpurascens* Gmel. Siberian Leek having purplish Flowers.

The 1st Sort is commonly cultivated in the English Gardens; of this there has been generally supposed two Sorts, but I have made Trial of them both, by sowing their Seeds several Times, and find they are the same; the Difference which has risen between them, has been occasioned by some Persons having saved the Seeds from old Roots, and not from the seedling Leeks, whereby they have degenerated them and rendered them smaller and narrower leaved, but by Care this may be recovered again, as I have experienced.

The other Sort grows naturally in *Siberia*; this hath narrower Leaves than the common Sort, the Stalks are smaller and do not rise so high; the Heads of Flowers are also smaller, and of a purplish Colour; the Stamina stands out beyond the Flower.

Leeks are cultivated by sowing their Seeds in the Spring, in the same Manner as was directed for Onions, with which these are commonly sown, the two Sorts of Seeds being mixed according to the Proportion which is desired of either Sort, though the most common Method is, to mix an equal Quantity of both, for the Onions will greatly out-grow the Leeks in the Spring, but these being drawn off in July, the Leeks will have Time to grow large afterwards, so that there may be a moderate Crop of both Sorts. The Management of Leeks being exactly the same with Onions, I shall not repeat it in this Place; but shall only add, that many Persons sow their Leeks very thick in Beds in the Spring; and in June, after some of their early Crops art taken off, they dig up the Ground, and plant their Leeks out thereon, in Rows a Foot apart, and six Inches

Inches asunder in the Rows, observing to water them until they have taken Root; after which they will require no further Culture, but to clear the Ground from Weeds. The Leeks thus planted will grow to a great Size, provided the Ground be good, and this Method is very proper for such Persons who have little Room.

If you would save the Seeds of this Plant, make Choice of some of the largest and best you have, which must remain in the Place where they grew until February, when they should be transplanted in a Row against a warm Hedge, Pale, or Wall, at about 8 Inches asunder; and when their Stems advance, they should be supported by a String, to prevent their being broken down, to which they are very liable, when in head; the closer they are drawn to the Fence in Autumn, the better the Seeds will ripen; for it sometimes happens in cold Summers or Autumns, that those which grow in the open Garden, do not perfect their Seeds in this Country, especially if there should be sharp Frosts early in Autumn, which will entirely spoil the Seed.

When it is ripe (which may be known by the Heads changing brown) you should cut off their Heads with about a Foot or more of the Stalk to each, and tie them in Bundles, 3 or 4 Heads in each, and hang them up in a dry Place, where they may remain till Christmas or after, when you may thresh out the Seeds for Use. The Husk is very tough, which renders it difficult to get out the Seeds; therefore some Persons who have but a small Quantity, rub it hard against a rough Tile, which will break the Husks, and get the Seeds out better than any other Method.

PORTULACA. Tourn. Inst. R. H. 236. Tab. 118. Lin. Gen. Plant. 531. Purslane; in French, Pourpier.

The Characters are,

The Empalement of the Flower is small, bifid, and permanent, sitting upon the Germen. The Flower has five plain, erect, obtuse Petals, and many Hair-like Stamina, about half the Length of the Petals, terminated by single Summits; and a roundish Germen, supporting a short Style, crowned by 5 oblong Stigmas. The Germen becomes an oval Capsule with one Cell, containing many small Seeds.

The Species are,

1. PORTULACA foliis cuneiformibus, floribus sessilibus. Prod. Leyd. 473. Purslane with Wedge-shaped Leaves, and Flowers growing close to the Stalks. This is the *Portulaca latifolia seu sativa* C. B. P. 288. Broad-leaved, or Garden Purslane.

2. PORTULACA foliis subulatis alternis, axillis pilosis, floribus sessilibus. Lin. Sp. Plant. 445. Purslane with Awl-shaped Leaves placed alternately, hairy Joints, and Flowers sitting close to the Stalks. This is the *Portulaca Curassavica angusto longo lucidoque folio, procumbens*. Hort. Amst. 1. p. 2. Trailing Purslane of Curassao, with long narrow shining Leaves.

3. PORTULACA foliis ovatis petiolatis, caule procumbente, floribus sessilibus muscosis. Purslane with oval Leaves having Foot Stalks, a trailing Stalk, and Moss-like Flowers sitting close. This is the *Portulaca Curassavica procumbens, capparidis folio, flore muscoso, capsula bifurcata*. Par. Bat. 213. Trailing Purslane of Curassao with a Caper Leaf, Moss-like Flower, and a forked Capsule.

4. PORTULACA foliis ovatis gibbis, pedunculo multifloro, caule fruticoso. Lin. Sp. 445. Purslane with oval

gibbous Leaves, Foot Stalks having many Flowers, and a shrubby Stalk. This is the *Telephiastrum folio globofo*. Hort. Elsb. Bastard Orpine with a globular Leaf.

The 1st Sort grows naturally in America, and most of the hot Parts of the Globe. This is the common Purslane cultivated in Gardens, and is so generally known as to need no Description. There are two Varieties of it, one with deep green Leaves, and the other yellow Leaves, which is called Golden Purslane; but as both these arise from the same Seeds, they are only feminal Variations. There is also a third Variety with smaller and less succulent Leaves, called Wild Purslane, because where it is once sown in a Garden, and the Plants permitted to scatter their Seeds, the Plants will come up as Weeds the following Year; but this I am sure is a Degeneracy from the Garden Purslane, for I have sown it several Times and let the Plants shed their Seeds, and it has come up from those Seeds in 2 Years, degenerated to the wild Sort.

Purslane is propagated from Seeds, which may be sown upon Beds of light rich Earth during any of the Summer Months; but if you intend to have it early in the Season, it should be sown upon a hot Bed; for it is too tender to be sown in the open Air before April, and then it must be in a warm Situation. This Seed is very small, so that a little of it will be sufficient to supply a Family. There is no other Culture which this Plant requires, but to keep it clear from Weeds, and in dry Weather to water it twice or three Times a Week. In warm Weather this Plant will be fit for Use in six Weeks after sowing, so that in order to continue a Succession of it, you should sow it at 3 or 4 different Seasons, allowing a Fortnight or three Weeks between each Sowing, which will be sufficient to last the whole Summer, while it is proper to be eaten; for being of a very cold Nature, it is unsafe to be eaten, except in the Heat of Summer in England; for which Reason, it is not to any Purpose to sow it upon a hot Bed, since it will come early enough for Use in the open Air.

If the Seeds are intended to be saved, a Number of the earliest Plants should be left for this Purpose, drawing out all those which are weak, or have small Leaves, from among them; when the Seeds are ripe, the Plants should be cut up, and spread on Cloths in the Sun to dry, then the Seeds may be easily beaten out and sifted, clear it from the Leaves and Seed Vessels.

The 2d Sort grows naturally in the Islands of the West-Indies; this is annual; the Stalks are very succulent, of a purple Colour, and branch out greatly; the lower Branches lie near the Ground, but those above them are more erect; the Leaves are narrow, Awl-shaped, and of a lucid green; they are placed alternately on the Branches. At the Joints come out Tufts of white Hairs and between these come out the Flowers sitting close to the Branches; they are of a fine Pink Colour, but of short Duration, seldom continuing open longer than 5 or 6 Hours; these are succeeded by short roundish Capsules, filled with small black Seeds. It flowers from the Middle of June till Autumn.

The 3d Sort grows naturally in many of the Islands in the West-Indies; this is also an annual; the Stalks spread flat on the Ground, these are garnished with oval Leaves, of a thinner Texture than those of the former Sorts.

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The Flowers are small, greenish, and sit close to the Branches; these are succeeded by forked Capsules with one Cell which opens transversely, and is filled with small black Seeds. These Plants are preserved in Botanick Gardens for Variety; their Seeds must be sown upon a hot Bed in Spaing, and when the Plants are fit to transplant, they should be planted upon another hot Bed to bring them forward, and about the Beginning of June they may be transplanted on a warm Border, where, if the Season is favourable, they will ripen Seeds; but lest it should prove otherwise, it will be proper to keep one Plant of each Sort under Cover, to ripen their Seeds, in order to preserve the Species.

The 4th Sort grows naturally at the Cape of Good Hope; this is a perennial Plant with a shrubby Stalk, which rises 4 or 5 Inches high, garnished with thick, globular, succulent Leaves; at the Top of the Stalk comes forth a slender Foot Stalk about 2 Inches long, sustaining 4 or 5 Rose-shaped Flowers of a reddish Colour. These appear in July, but are not succeeded by Seeds in England. This Plant is too tender to live in the open Air in Winter, so it must be kept in Pots, and treated as the most succulent Kinds of Fig Marygolds. It is propagated by Cuttings as they are.

POTENTILLA. Lin. Gen. P. 559. *Quinquefolium pentaphylloides*. Tourn. Inst. 296. Tab. 153. 298. Cinquefoil; in French, *Quinte-feuille*.

The Characters are,

The Empalement of the Flower is of one Leaf, which is slightly cut into 10 Parts, and the Segments are alternately left and reflexed. The Flower is composed of 5 Petals, which are inserted into the Empalement, and spread open. It hath 20 Awl-shaped Stamina inserted in the Empalement, terminated by Moon shaped Summits. In the Center of the Flower there are several Germina collected into one Head, with very slender Styles inserted in the Side of the Germen, crowned by obtuse Stigmas. After the Flower is past, the Germina become a Head of roundish Seeds, included in the Empalement.

The Species are,

1. POTENTILLA foliis pinnatis serratis, caule repente. Flor. Lapp. 210. Potentilla with winged sawed Leaves, and a creeping Stalk. This is the *Pentaphylloides argenteum alatum*, seu *potentilla*. Tourn. Inst. 298. Silver Weed, or Wild Tansy.

2. POTENTILLA foliis pinnatis alternis, foliolis quinis ovatis crenatis, caule erecto. Hort. Cliff. 193. Potentilla with alternate winged Leaves, having five oval crenated Lobes, and an erect Stalk. This is the *Pentaphylloides erectum*. J. B. 2. p. 398. Upright Cinquefoil.

3. POTENTILLA foliis pinnatis, caule fruticoso. Hort. Cliff. 193. Potentilla with winged Leaves and a shrubby Stalk. This is the *Pentaphylloides rectum fruticosum Eboracense*. Mor. Hist. 2. 193. Upright shrubby Cinquefoil of Yorkshire, commonly called shrubby Cinquefoil.

4. POTENTILLA foliis digitatis lanceolatis serratis utrinque subpilosis, caule erecto. Lin. Sp. Plant. 497. Potentilla with Finger-shaped Leaves, which are Spear-shaped, sawed, and hairy on both Sides, and have an erect Stalk. This is the *Quinquefolium rectum luteum*. C. B. P. 325. Yellow upright Cinquefoil.

5. POTENTILLA foliis quinatis cuneiformibus incisfis subtus tomentosis, caule erecto. Lin. Sp. Plant. 497. Potentilla

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with five Wedge-shaped cut Leaves, which are woolly on their under Side, and have an erect Stalk. This is the *Quinquefolium folio argenteo*. C. B. P. 325. Cinquefoil with a silvery Leaf.

6. POTENTILLA foliis digitatis apice conniventi-serratis, caulibus filiformibus procumbentibus, receptaculis birsutis. Hort. Cliff. 194. Potentilla with Finger-shaped Leaves whose Points are sawed, very slender trailing Stalks, and hairy Receptacles. This is the *Quinquefolium album minus alterum*. C. B. P. 325. Another smaller white Cinquefoil.

7. POTENTILLA foliis ternatis, caule ramoso erecto, pedunculis supra genicula enatis. Hort. Upsal. 134. Potentilla with Leaves growing by Threes, an upright branching Stalk, and Foot Stalks rising above the Joints. This is the *Fragaria sterilis Alpina caulescens*. Boerb. Ind. alt. 1. p. 42. Stalky Alpine barren Strawberry.

8. POTENTILLA foliis ternatis, foliolis ovatis obtuse crenatis, caule ramoso, pedunculis longioribus. Potentilla with Leaves growing by Threes, the Lobes whereof are oval and obtusely crenated, a branching Stalk, and longer Foot Stalks. This is the *Fragaria sterilis caulescens foliis & crenis obtusioribus*. Hort. Chelf. Stalky barren Strawberry, with blunt Leaves and Indentures.

9. POTENTILLA foliis septenis quinatisque, foliolis pinnato-incisis pilosis, caule erecto ramoso. Potentilla with seven and five Leaves, whose Lobes are cut, winged, and hairy and an upright branching Stalk. This is the *Quinquefolium quod pentaphyllum seu potius heptaphyllum rectum, caule rubro birsutius*. Hort. Cath. Cinquefoil or Septfoil, with a red upright hairy Stalk.

10. POTENTILLA foliis septenis quinatisque, foliolis lanceolatis pinnato-dentatis utrinque pilosis, caule erecto corymbofo, petalis cordatis. Potentilla with five and seven Leaves whose Lobes are Spear-shaped, Wing-indented, and hairy on both Sides, and have an erect branching Stalk, with Heart-shaped Petals to the Flower. This is the *Pentaphyllum seu heptaphyllum, albo-pallidum seu flore ochroleuco, petalis singulis cordatis*. Mor. Hist. 2. 188. Cinquefoil or Septfoil, with a pale white, or white Ochre-coloured Flower, and Heart-shaped Petals.

There are many more Species of this Genus, which are preserved in Botanick Gardens for Variety, but as they are not cultivated in other Places either for Use or Beauty, I shall not enumerate them here.

The 1st Sort grows naturally upon cold stiff Land in most Parts of England, and is a sure Mark of the Sterility of the Soil. It spreads its Stalks upon the Ground, which send out Roots from their Joints, fastening into the Ground, and thereby propagates so fast, as in a little Time to spread over and fill the Ground to a great Distance. The Leaves are composed of several Lobes (or Wings) which are generally placed alternately along the Mid-rib, and terminated by an odd one; they are sawed on their Edges, and are of a silvery Colour, especially on their under Side. The Flowers are produced singly upon very long Foot Stalks, which arise from the Root; they are composed of five yellow Petals, which expand in Form of a Rose; these have a great Number of Stamina which are inserted to the Petals, and many Germina collected in Heads, which afterward become many acute pointed Seeds wrapped up in the Empalement. It flowers great Part of Summer.

mer. The Leaves are used in Medicine, and are accounted restraining and vulnerary. It is never cultivated in Gardens, being a very common Weed in *England*.

The 2d Sort grows naturally on the *Alps*, and Mountains in *Germany*. This hath a perennial Root, which sends out several Heads joined together; from these arise the Foot Stalks of the Leaves, which are long, and sustain 3 Pair of roundish Lobes, terminated by an odd one; these are crenated on their Edges, and sit close to the Mid-rib. Out of each Head arises a hairy Stalk about 9 Inches high, having at each Joint one or two trifoliate Leaves, shaped like those below but smaller; the upper Part of the Stalk divides into small Foot Stalks, each sustaining 2 or 3 white Flowers, very like those of the Strawberry. These appear in *June*, and are succeeded by Seeds like those of the former. It is easily propagated by Seeds, or parting the Roots; the best Time for sowing the Seeds is in Autumn, also for parting and transplanting the Roots; it loves a moist Soil, and shady Situation.

The 3d Sort grows naturally in the northern Counties of *England*, and in many of the northern Parts of *Europe*. This hath a shrubby Stalk, which rises about 4 Feet high, dividing into many Branches, garnished by winged Leaves, composed of 2 or 3 Pair of narrow, acute-pointed, entire Lobes, which are hairy, and pale on their under Side. The Flowers are produced at the End of the Branches in Clusters, they have 5 yellow Petals spreading open in Form of a Rose, with many Germina and Stamina within. These appear in *July*, and are sometimes succeeded by Seeds inclosed in the Empalement. This Plant is cultivated in the Nursery Gardens as a flowering Shrub; it is commonly propagated by Suckers, or laying down the tender Branches, which will take Root in one Year, and may then be taken off from the old Plants, and planted in a Nursery for a Year or two to get Strength, before they are planted where they are designed to remain. It may also be propagated by Cuttings planted in Autumn in a moist shady Border, where they will take Root the next Spring, and the *Michaelmas* following, may be transplanted into the Nursery.

The best Season for transplanting these is in *October*, that they may get new Roots before the hard Frost sets in; for as this Plant grows naturally on moist boggy Land so when it is removed in Spring, if not duly watered in dry Weather, it is apt to miscarry; nor will this Plant live in a hot dry Soil, but in a shady Situation and on a cool moist Soil, it will thrive exceedingly.

The 4th Sort grows naturally in the South of *France* and *Italy*; this hath Hand-shaped Leaves, composed of 5 or 7 Lobes which join at their Base, where they meet the Foot Stalk; they are deeply crenated on their Sides, and are hairy on both Sides. The Stalks rise 9 to 10 Inches high, branching toward the Top, and garnished at each Joint with one Leaf of the same Form as those below, but smaller. The Flowers grow at the Top of the Stalk, they are white, and shaped like those of the former Sort, appearing about the same Time, and are succeeded by Seeds like those. This is a biennial Plant, which dies soon after the Seeds are ripe. It may be propagated as the 2d Sort.

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The 5th Sort grows naturally on the *Alps*, and in other rough hilly Parts of *Europe*. This hath a thick fleshy Root which strikes deep in the Ground, from which arise several purple branching Stalks about a Foot high, garnished with Leaves composed of five Wedge-shaped Lobes, deeply cut on their Edges, and very hoary on their under Side. The Flowers grow at the Top of the Stalk, which branches out into many Foot Stalks; they are yellow, and shaped like those of the 4th Sort but smaller. The Root is perennial, and the Plant may be propagated as the second Sort.

The 6th Sort grows on the Mountains in *Austria*; this hath a perennial Root; the Leaves stand on Foot Stalks which arise from the Root, and are very long; they are composed of 5 oblong Lobes which are a little sawed at their Ends, very hoary and silky on their under Sides, but green on their upper. The Flowers are produced on long slender Foot Stalks, which arise immediately from the Root; they are white, and shaped like those of the other Species, appearing in *May*, but are seldom succeeded by Seeds in *England*. It may be easily propagated by Runners as the Strawberry; the best Time to transplant them is in Autumn. It loves a cool Soil and a shady Situation.

The 7th Sort grows naturally on the *Alps*; this is a biennial Plant, the Stalks grow erect, about a Foot high; they are very hairy, and are garnished with trifoliate oblong Leaves, sawed on their Edges. The Flowers are produced upon Foot Stalks, which come out above the Joints of the Stalk; they are white, and very like those of the Strawberry. This Plant flowers in *June*, and the Seeds ripen in Autumn, which, if permitted to scatter, will produce Plants in Plenty the following Spring, which will require no other Culture, but to keep them clean from Weeds.

The 8th Sort is also a biennial Plant, but differs from the other, in having taller and stronger Stalks, which branch out more; the Lobes of the Leaves are oval, obtuse, and bluntly indented on their Edges; the Flowers are larger, and the whole Plant is of a deeper green. It flowers in *July*, and the Seeds ripen in Autumn. It propagates itself like the former Sort.

The 9th Sort grows naturally in *Italy* and *Sicily*; this is a biennial Plant; the Stalks rise near 2 Feet high, they are purple, very hairy, and are garnished with Leaves composed of 5 or 7 narrow Lobes, deeply cut on their Sides, so as to resemble those of winged Leaves; the Stalks branch out greatly toward their Top. The Flowers are yellow, and shaped like those of the 4th Sort. It flowers in *June*, and the Seeds ripen in Autumn. It may be propagated as the fourth Sort.

The 10th Sort grows naturally in the South of *France* and *Italy*; this is a biennial Plant; the Stalks are large, and rise near 2 Feet high; they branch very much toward their Top; the Leaves stand on very short Foot Stalks; they are sometimes composed of 5, and at other Times of 7 Lobes, which are regularly indented like winged Leaves, and are very hairy on both Sides. The Flowers are produced at the Top of the Stalk, each having a Foot Stalk an Inch and a Half long; their Empalements are deeply cut into 9 Segments, which end in acute Points. The Flowers have sometimes 5, but generally 6 Heart-shaped Petals of a pale yellow,

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yellow, and expand like those of the former Sorts. It flowers in July, and the Seeds ripen in Autumn, which, if permitted to scatter, will produce Plenty of Plants the following Spring. This requires no other Culture, than to keep it clean from Weeds.

POTERIUM. *Lin. Gen. Plant.* 948. *Pimpinella*. *Tourn. Inst.* 156. Burnet; in French, *Pimprenelle*.

The Characters are,

It hath male and female Flowers in the same Spike. The male Flowers have a three-leaved Empalement; they have one Petal, which is cut into four Parts; these are oval, concave, and permanent; they have a great Number of long Hair-like Stamina, terminated by roundish Twin Summits. The female Flowers have one Wheel-shaped Petal with a short Tube, cut at the Brim into four Parts; these have no Stamina, but two oblong oval Germina with two hairy Styles the Length of the Petal, crowned by coloured Pencil-shaped Stigmas. The Germina afterward become two hard Seeds, inclosed in the Petal of the Flower.

The Species are,

1. **POTERIUM inerme, caulibus subangulosis.** *Hort. Cliff.* 446. Unarmed *Poterium* with angular Stalks. This is the *Pimpinella sanguisorba minor hirsuta*. *C. B. P.* 160. Smaller hairy Burnet.

2. **POTERIUM inerme, caulibus teretibus strictis.** *Lin. Sp. Plant.* 994. Unarmed *Poterium* with a narrow taper Stalk. This is the *Pimpinella agrimoides odorata*. *H. R. Par.* Sweet-swelling Burnet resembling Agrimony.

3. **POTERIUM spinis ramosis.** *Hort. Cliff.* 445. *Poterium* with branching Spines. This is the *Pimpinella spinosa, seu sempervirens*. *Mor. Umb.* 57. Prickly or ever-green Burnet.

The first Sort is the common Burnet, which grows naturally upon chalky Lands in many Parts of England; of this there are 2 or 3 Varieties, one of them is much smoother than the other, and the third hath larger Seeds than either of the former; but these Differences are not constant, so they are only femal Variations. This is a perennial Plant, from whose Root arise a great Number of Leaves, standing on pretty long Foot Stalks; they are composed of 5 or 6 Pair of Lobes, terminated by an odd one. The Lobes are generally ranged a little alternate on the Mid-rib, but sometimes stand by Pairs; these are sawed on their Edges, and are sometimes smooth, and at others hairy. The Stalks rise a Foot and a Half high, branching out pretty much, and are terminated by long slender Foot Stalks, each sustaining an oblong Spike of Flowers, in which there are some male and others female; they are of a purplish red Colour, and appear in June. The female Flowers are each succeeded by two hard Seeds, which ripen in Autumn.

This Plant is propagated in Gardens; the young tender Leaves are put into Sallads, and the Leaves are used for cool Tankards in hot Weather. It is used in Medicine, and is reckoned to be cordial and alexipharmick. The Powder of the Root is commended against spitting of Blood.

This Plant is easily propagated by Seeds, which should be sown in Autumn, for if it is sown in Spring, the Seeds frequently lie in the Ground till the Spring following. If the Seeds are permitted to scatter, the Plants will come up in Plenty; if these are transplanted

out in a Bed of undunged Earth, at about a Foot Distance every Way, and kept clean from Weeds, they will continue several Years, especially if the Soil is dry, and will require no other Care. It may also be propagated by parting the Roots in Autumn, but as the Plants arise so freely from scattered Seeds, the latter Method is seldom practised.

The 2d Sort grows naturally in the South of France and Italy; this is a biennial Plant, which decays soon after the Seeds are ripe. The Leaves of this are like those of Agrimony, and are composed of 3 or 4 Pair of oblong Lobes, placed a little alternate on the Mid-rib, and terminated by an odd one; they are deeply sawed on their Edges, and have an agreeable Scent; the Stalks rise 2 Feet high, and are garnished at each Joint with one of those winged Leaves, which gradually diminish in their Size to the Top, and just above the Leaf arises a long Foot Stalk, which supports 2 or 3 small ones, each sustaining a small roundish Spike of Flowers. These appear in July, and are succeeded by Seeds which ripen in Autumn. It is propagated by Seeds, which, if sown in Autumn, the Plants will come up the following Spring. These require no other Culture than to thin them where they are too close, and keep them clean from Weeds; the second Year they will flower and ripen their Seeds, and soon after decay.

The 3d Sort grows naturally in Crete, and in many of the Islands of the Archipelago. This hath a shrubby perennial Stalk, which rises about 3 Feet high, dividing into several slender Branches armed with branching sharp Thorns; the Leaves are very small, they are winged, and have 6 or 7 Pair of very small Lobes, ranged opposite along the Mid-rib, terminated by an odd one; they are of a lucid green, and continue all the Year. The Flowers are produced in small Heads at the End of the Branches, and are of an herbaceous Colour; they appear the Beginning of June, and there is a Succession of them most Part of Summer, but those only which come early are succeeded by Seeds.

This Plant is too tender to live through the Winter in the open Air, but if it is sheltered under a common hot Bed Frame, where it may have the free Air at all Times when the Weather is mild, and sheltered from hard Frost, it will thrive better than when it is more tenderly treated. It may be propagated by Slips or Cuttings during any of the Summer Months, which, if planted in a Bed of light Earth, and covered down close with a Hand or Bell Glass, and shaded from the Sun, will take Root freely, and may then be taken up and planted each into a small Pot, filled with fresh undunged Earth, and placed in the Shade till they have taken new Root, and then removed to a sheltered Situation, where they may stand till the Frost comes on, when they should be placed under the hot Bed Frame. It requires but little Water, especially in cool Weather.

PRASIUM. *Lin. Gen. Plant.* 655. *Galeopsis*. *Tourn. Inst. R. H.* 186. Shrubby Hedge-nettle.

The Characters are,

The Flower hath a Bell-shaped Empalement of one Leaf, dividing into 2 Lips; the upper Lip is broad, and ends in 3 acute Points; the lower Lip is cut into 2 Parts. The Flower

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is of the Lip Kind, it hath one Petal; the upper Lip is oval, erect, and indented at the End. The lower Lip is broad, reflexed, and ends in 3 Points, the middle one being broadest. It has 4 Awl-shaped Stamina under the upper Lip, 2 of which are shorter than the other, having oblong Summits on their Side, and a four-pointed Germen sustaining a slender Style the Length of the Stamina, crowned by a bifid Stigma. The Germen afterward becomes 4 Berries, each containing a single roundish Seed.

The Species are,

1. *PRASIUM foliis ovato-oblongis serratis*. Hort. Cliff. 309. Shrubby stinking Hedge-nettle, with oblong, oval, sawed Leaves. This is the *Galeopsis Hispanica*, frutescens, *teucrii folio*. Town. Inst. 186. Spanish shrubby stinking Hedge-nettle, with a Tree Germander Leaf.

2. *PRASIUM foliis ovatis, duplici utrinque crenâ notatis*. Lin. H. C. 309. Shrubby stinking Hedge-nettle, with oval Leaves indented on every Side. *Lamium fruticosum, teucrii folio lucido, calyce & flore magno candido, tantillâ purpurâ variè notato*. Hort. Cath. 106. Shrubby Dead-nettle, with a lucid Tree-Germander Leaf, and a large white Flower with some Spots of purple.

The 1st Sort grows naturally in Spain and Italy; this rises with a shrubby Stalk near 3 Feet high, covered with a whitish Bark, and divides into many Branches, garnished with oblong oval Leaves, which are sawed on their Edges. The Flowers come out from the Bottom of the Leaves in Whorls round the Stalks, they are white, and have large permanent Empalements, cut into 5 Points. The Flowers are of the Lip Kind, they appear in June and July, and are succeeded by 4 small Berries sitting in the Empalement, which turn black when ripe, and have a single roundish Seed in each.

The 2d Sort grows naturally in Sicily; this hath a shrubby Stalk like the former, but rises a little higher; the Bark is whiter, the Leaves shorter, oval, and are doubly crenated on each Side, they are of a lucid green. The Flowers come out in small Whorls from the Bottom of the Leaves, like the former; they are somewhat larger, and are frequently marked with a few purple Spots; these are succeeded by small Berries like the other Sort, which ripen at the same Time.

These Plants may be propagated by Cuttings, or from the Seeds: If by Cuttings, they should be planted on a shady Border toward the End of April; but the Cuttings should not be taken from such Plants as have been drawn weak, but rather from those which have been exposed to the open Air, whose Shoots are short and strong; and if a Joint of the former Year's Wood is cut to each of them, they will more certainly succeed. These Cuttings may remain in the same Border till they are well rooted, when they may be transplanted where they are to remain, or into Pots, that they may be sheltered in Winter under a common Frame, where they may have as much free Air as possible in dry Weather, and only require to be screened from hard Frost.

If they are propagated by Seeds (which the Plants produce in Plenty every Year) they should be sown on a Bed of light Earth in April; and in May the Plants will come up, when they require no other Care but that of keeping them clean from Weeds; in the Au-

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turn following, they may be transplanted as before directed for the Cuttings, and may be afterward treated more hardily, as they acquire Strength.

A Plant or two of each of these Species may be allowed to have a Place where there are Collections of the different Sorts of ever-green Shrubs, for Variety, especially where the different Sorts of Cistus, Phlomis, Tree Wormwood, and Medicago, are admitted, because they are equally hardy; and when a severe Winter happens, which destroys the one, the others are sure of the same Fate; but in mild Winters they will live abroad, especially if they are planted in a dry rubbishy Soil, and have a sheltered Situation; but in rich wet Ground, the Plants will grow vigorous in Summer, so are liable to Injury from the early Frosts in Autumn.

PRENANTHES. Lin. Gen. Plant. 816. Vaill. Mem. Ann. 1721. Wild Lettuce.

The Characters are,

It hath a smooth cylindrical Empalements spreading at the Brim, having many Scales which are equal, but have three at the Base unequal. This common Empalement includes from five to eight hermaphrodite Florets, disposed in a single round Order; they have one Petal which is stretched out like a Tongue, and indented in four Parts at the End; they have five short Hair-like Stamina, terminated by cylindrical Summits. The Germen is situated under the Petal, supporting a slender Style longer than the Stamina, crowned by a bifid reflexed Stigma. The Germen afterward becomes a single Heart shaped Seed, crowned with hairy Down.

The Species are,

1. *PRENANTHES flosculis quinis, foliis lyrato-bastatis*. Hort. Cliff. 383. *Prenanthes* with five Florets, and Lyred-Spear-shaped Leaves. This is the *Lactuca sylvestris murorum, flore luteo*. J. B. 2. p. 1004. Wild Wall Lettuce, with a yellow Flower.

2. *PRENANTHES flosculis quinis, foliis lanceolatis denticulatis*. Hort. Cliff. 383. *Prenanthes* with five Florets, and Spear-shaped indented Leaves. This is the *Lactuca montana purpureo-cerulea major*. C. B. P. 123. Greater purple blue Mountain Lettuce.

3. *PRENANTHES erecta, flosculis quinis foliis trilobis*. Lin. Sp. Plant. 797. Upright *Prenanthes* with five Florets, and Leaves having three Lobes. This is the *Prenanthes Canadensis altissima, foliis variis, flore luteo*. Vaill. Aët. 1721. Tallest *Prenanthes* of Canada, with variable Leaves and a yellowish Flower.

4. *PRENANTHES flosculis quinis, caule ramoso, foliis ovato-lanceolatis semiamplexicaulibus*. *Prenanthes* with five Florets, a branching Stalk, and oval Spear-shaped Leaves half embracing the Stalk. This is the *Lactuca montana, purpureo-cerulea minor*. C. B. P. 143. Smaller purple blue Mountain Lettuce.

The 1st Sort grows naturally on Walls and dry shady Banks in England, so is never cultivated in Gardens. The 2d Sort grows naturally upon the Helvetian Mountains; this hath a creeping Root, which spreads far in the Ground, so becomes a troublesome Weed if admitted into Gardens. The Stalks rise 4 Feet high; the Leaves are Spear-shaped, and a little indented toward their Ends; the Flowers are of a purple blue Colour, and are produced loose in Panicles from the Sides, and at the Top of the Stalks. These appear in July, and are succeeded by Seeds which ripen in Autumn.

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The 3d Sort grows naturally in most Parts of *North America*, where it is called *Dr. Witt's Rattle-snake Root*; this seldom lives longer than two Years. The lower Leaves are 4 or 5 Inches long, and 3 broad; they are sometimes divided into 5 Lobes, but generally into three; they are indented a little on their Edges, smooth, of a dark green on their upper Side, but pale on their under. The Stalks rise 3 Feet high, and are garnished with a few small Leaves which are entire; the Flowers come out from the Side of the Stalk in small Bunches; these are of a pale yellow Colour, and appear in *July*. They are succeeded by Seeds, crowned with hairy Down, which ripen in Autumn. There is a Variety of this with pale purple Flowers which arises from the same Seeds. The Roots of these Plants are said to be an Antidote to expel the Venom of the Rattle-snake, which induced me to mention them.

The 4th Sort grows naturally on the Mountains in *Germany*; this hath a perennial Root. The Stalks rise a Foot high, and branch out on each Side; the Leaves are Spear-shaped and oval; their Base is broad, and half surrounds the Stalk; the Flowers grow loosely upon slender Foot Stalks which come out from the Side, and at the End of the Branches. These appear in *June*, and the Seeds ripen in Autumn.

These Plants are seldom admitted into Gardens, but any Person desirous to cultivate them, may sow the Seeds soon after they are ripe in a sheltered Situation, and the Plants will come up, and require no Care but to keep them clear from Weeds.

PRIMULA. *Lin. Gen. Plant.* 180. *Primula veris*. *Tourn. Inst. R. H.* 124. *Tab.* 47. [This Plant is so called, because it is the first Plant that appears in the Spring]. The Primrose; in *French*, *Primevere*.

The Characters are,

The Flower hath a five-cornered tubulous Empalement of one Leaf, ending in 5 acute Points; it hath one Petal with a cylindrical Tube the Length of the Empalement, but spreads open above, where it is cut into 5 Heart-shaped Segments. It has 5 short Stamina situated in the Neck of the Petal, terminated by erect acute-pointed Summits, and a globular Germen supporting a slender Style crowned by a globular Stigma. The Germen turns to an oblong Capsule, with one Cell opening at Top, filled with small angular Seeds.

The Species are,

1. PRIMULA foliis dentatis rugosis, pedunculis unifloris. Primrose with rough indented Leaves and Foot Stalks bearing one Flower. This is the *Primula veris odorata, flore luteo simplicis*. *J. B.* Sweet-smelling Primrose with a single yellow Flower, or common Primrose.

2. PRIMULA foliis dentatis rugosis, floribus fastigiatis. Primrose with rough indented Leaves, and Flowers growing in Bunches. This is the *Primula veris pallida flore elatior*. *Clus. Hist.* 301. Taller Primrose with a pale Flower, called Cowslip.

3. PRIMULA foliis cuneiformibus glabris, segmentis corollarum bifidis. Primrose with smooth Wedge-shaped Leaves, and bifid Segments to the Empalement. This is the *Primula veris rubro flore*. *Clus. Hist.* 300. Primrose with a red Flower, called Birds-eye.

4. PRIMULA foliis petiolatis subcordatis crenatis, floribus fastigiatis pedunculis longissimis. Primrose with

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Heart-shaped crenated Leaves having Foot Stalks, and Flowers growing in Bunches on very long Foot Stalks.

The 1st Sort grows wild in Woods, and other shady Places in most Parts of *England*, from whence their Roots may be easily transplanted into the Garden, where, if they are placed under Hedges, and in shady Walks, they make a beautiful Appearance early in the Spring, when few other Plants are in flower.

This Plant is so well known as to need no Description; the Flowers and Roots are used in Medicine.

There are several Varieties of this which have been accidentally obtained, as the Paper-white Primrose with single and double Flowers, the common Primrose with double Flowers, the red Primrose with single and double Flowers; these have but one Flower upon a Foot Stalk.

The 2d Sort is the Cowslip, or *Paigle*, or *Paralysis* of the Shops; this grows naturally in Meadows and moist Pastures in many Parts of *England*. The Flowers of this Sort grow in Bunches on the Top of the Foot Stalk, so are easily distinguished from the former; they are much used in Medicine, and sometimes the Leaves. As these grow wild, their Roots may be taken up, and transplanted into Gardens.

The best Time to transplant them is at *Michaelmas*, that their Roots may have Strength to produce their Flowers early in the Spring. These delight in a strong rich Soil, but will grow in almost any Sort of Earth, provided they have a shady Situation.

There are a great Variety of this at present in the Gardens, as the *Hose in Hose*, the double Cowslip, and all the Sorts of *Polyanthus*, which have been so much improved within the last fifty Years, as to almost equal the Variety of the *Auriculas*; and in some Parts of *England* they are so much esteemed as to sell for a Guinea a Root, so that there may be still a much greater Variety raised, as there are so many Persons engaged in the Culture of this Flower.

The several Varieties of *Polyanthuses* are produced by sowing of Seeds, which should be saved from such Flowers as have large upright Stems, producing many Flowers upon a Stalk, which are large, beautifully striped, open flat, and not Pin-eyed. From the Seeds of such Flowers there is Room to hope for a great Variety of good Sorts, but no ordinary Flowers should stand near them, lest, by the Mixture of their Farina, the Seeds should be degenerated.

These Seeds should be sown in Boxes filled with light rich Earth in *December*, being very careful not to bury the Seed too deep; for if it be only slightly covered with light Earth, it will be sufficient. These Boxes should be placed where they may have the Benefit of the Morning Sun until ten of the Clock, but must by no means be exposed to the Heat of the Day, especially when the Plants begin to appear; for at that Time one whole Day's Sun will entirely destroy them. In the Spring, if the Season should prove dry, you must often refresh them with Water; and, as the Heat increases, you should remove the Boxes more in the Shade, for the Heat is very injurious to them.

By the Middle of *May* these Plants will be strong enough to plant out, at which Time you should prepare some shady Borders which should be made rich with

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Neats Dung, upon which you must set the Plants about four Inches asunder every Way, observing to water them until they have taken Root; after which they will require no farther Care but to keep them clear from Weeds, until the latter End of August following, when you should prepare some Borders, which are exposed to the East, with good light rich Earth, into which you must transplant your Polyanthuses, placing them six Inches asunder equally in Rows, observing, if the Season proves dry, to water them until they have taken Root. In these Borders your Plants will flower the succeeding Spring, at which Time you must observe to mark such of them as are fine, to preserve, and the rest may be transplanted into Wildernesses, and other shady Places in the Garden, where, although they are not very valuable Flowers, they will afford an agreeable Variety.

Those, which you intend to preserve, may be removed soon after they have done flowering (provided you do not intend to save Seeds from them), and may be then transplanted into a fresh Border of the like rich Earth, allowing them the same Distance as before, observing also to water them until they have taken Root; after which they will require no farther Care, but to keep them clean from Weeds, and the following Spring they will produce strong Flowers, as their Roots will be then in full Vigour; so that, if the Kinds are good, they will be little inferior to a Shew of Auriculas.

These Roots should be constantly removed and parted every Year, and the Earth of the Border changed, otherwise they will degenerate, and lose the greatest Part of their Beauty.

If you intend to save Seeds, which is the Method to obtain a great Variety, you must mark such of them, which, as I said before, have good Properties. These should be, if possible, separated from all ordinary Flowers, for if they stand surrounded with plain-coloured Flowers, they will impregnate each other, whereby the Seeds of the valuable Flowers will not be near so good, as if the Plants had been in a separate Border, where no ordinary Flowers grew; therefore the best way is to take out the Roots of such as you do not esteem as soon as the Flowers open, and plant them in another Place, that there may be none left in the Border, but such as you would choose for Seeds.

The Flowers of these should not be gathered, except such as are produced singly upon Pedicles, leaving all such as grow in large Bunches; and if the Season should prove dry, refresh them now and then with Water, which will cause their Seeds to be larger, and in greater Quantity. In June the Seed will be ripe, which may be easily known by the Pods changing brown, and opening; so that you should at that Time look over the Plants 3 Times a Week, gathering each Time such of the Seed Vessels as are ripe, which should be laid upon a Paper to dry, and may then be put up until the Season of sowing.

As the Plants, which arise from Seeds, generally flower much better than Offsets, those, who would have these Flowers in Perfection, should annually sow their Seeds.

PRIMROSE-TREE. See Onagra

PRINOS. Lin. Gen. Plant. 398. Winterberry.

The Characters are,

The Flower hath a permanent Empalement of one Leaf, which is cut into six small plain Segments, and is permanent; it hath one Wheel-shaped Petal, with no Tube, cut into six plain Segments; it hath six Awl-shaped Stamina, shorter than the Petal, terminated by obtuse Summits, and an oval Germen sitting upon the Style crowned by an obtuse Stigma. The Germen afterward turns to a round Berry opening in three Parts including one hard Seed.

The Species are,

1. PRINOS foliis longitudinaliter serratis. Lin. Sp. P. 330. Winterberry with Leaves sawed Lengthways.
2. PRINOS foliis apice serratis. Lin. Sp. Plant. 330. Prinos with Leaves sawed at the Points.

The 1st Sort grows naturally in Virginia, and other Parts of North America. This rises with a shrubby Stalk 8 or 10 Feet, sending out many Branches from the Sides the whole Length, which are garnished with Spear-shaped Leaves, about 3 Inches long and one broad in the Middle, terminating in acute Points; they are of a deep green, veined on their under Side, and sawed on their Edges, having slender Foot Stalks standing alternately on the Branches. The Flowers come out from the Side of the Branches, sometimes single, at others 2 or 3 at each Joint; they have no Tube, but are Wheel-shaped, and cut into 6 Parts; they have 6 Awl-shaped erect Stamina terminated by obtuse Summits, and an oval Germen sitting upon the Style crowned by an obtuse Stigma; these are succeeded by Berries about the Size of those of Holly, which turn purple when ripe. It flowers in July, and the Seeds ripen in Winter.

The 2d Sort grows naturally in Canada; this is of lower Growth, than the former. The Leaves are shorter, and sawed at their Points, but the Flowers of this I have not seen.

It is propagated by Seeds, which should be sown soon after they are ripe upon a Bed of light Earth, covering them about one Inch with the same Sort of Earth. The Seeds, which are so soon put into the Ground, will many of them come up the following Spring, whereas those, which are kept longer out of the Ground, will remain a whole Year in the Ground before the Plants will appear, in the same Manner as the Holly, Hawthorn, and some others; therefore the Ground should not be disturbed, if the Plants do not come up the first Year. The young Plants may be treated as hath been directed for the American Hawthorns, and are full as hardy, but they delight in a moist Soil and a shady Situation; for in hot Land they make but little Progress, and rarely produce any Fruit.

PRIVET. See Ligustrum.

PROTEA. Lin. Gen. Plant. 104. Conocarpodendron. Boerh. Ind. alt. 2. 195. Silver Tree.

The Characters are,

The Flowers are collected in an oval Head; they have one common imbricated scaly Perianthium. The Flower is of one Petal, having a Tube the Length of the Empalement; the Brim is cut into 4 Parts which spread open, and are equal. It has 4 bristly Stamina the Length of the Petal, terminated by incumbent Summits, and a roundish Germen with an erect bristly Style crowned by an obtuse Stigma.

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Stigma. The Germen afterward turns to a roundish naked Seed sitting in a distinct Cell of the Cone.

The Species are,

1. *PROTEA foliis lineari-lanceolatis integerrimis, superioribus hirsutis nitidis. Prod. Leyd. 184.* Protea with linear, Spear-shaped, entire Leaves, the upper of which shine, and are hairy. This is the *Frutex Æthiopicus conifer, foliis cneori, salici æmulus. Breyn. Cat. Tab. 9.* Cone-bearing Shrub of *Æthiopia* with Leaves resembling those of the Willow or *Cneorum*.

2. *PROTEA foliis lanceolatis integerrimis acutis hirsutis nitidis. Hort. Cliff. 29.* Protea with entire, Spear-shaped, acute, hairy, shining Leaves. This is the *Conocarpodendron foliis argenteis sericeis latissimis. Boerb. Ind. alt. 2. p. 195.* *Conocarpodendron* with broad, silky, silvery Leaves, commonly called Silver Tree.

3. *PROTEA foliis oblongo-ovatis hirsutis nitidis integerrimis. Protea* with oblong, oval, hairy, shining Leaves, which are entire. This is the *Lepidocarpodendron folio saligno lato, caule purpurascente. Boerb. Ind. alt. 2. 183.* *Lepidocarpodendron* with a broad Willow Leaf and a purplish Stalk, otherwise called Wageboom.

These Plants are Natives of the Country near the *Cape of Good Hope* whete there is a great Number of Species. In the Catalogue of the *Lyden* Garden there are upward of twenty Sorts enumerated; not that they have them growing there, but they have good Drawings of them, which were made in the Country, where they are Natives. The three Sorts here mentioned I have now growing in the *Chelsea* Garden.

These Plants are many of them well figured in the Index of the Plants of the *Leyden* Garden, which was published by Dr. *Boerhaave* in 1719 by the Titles of *Lepidocarpodendron*, *Conocarpodendron*, and *Hypophyllocarpodendron*, and, by some former Writer on Botany, this Genus was intituled *Scolymo-cephalus*, from the Resemblance which the Cones of these Trees have to the Head of an Artichoke.

As these Plants are Natives of the *Cape of Good Hope*, they are too tender to live Abroad through the Winter in *England*, but the first Sort is hardy enough to live in a good Green-house. This Sort will grow 10 or 12 Feet high, and may be trained up with a regular strait Stem, and the Branches will naturally form a regular large Head. The Leaves are long and narrow, and of a shining Silver Colour; and, as they remain the whole Year, the Plants make a fine Appearance, when they are intermixed with others in the Green house. In the Summer these may be placed in the open Air in a sheltered Situation; for, if they are exposed to Winds, the Plants will be torn and rendered unsightly, nor will they make any Progress in their Growth. In warm Weather they must be frequently but sparingly watered, and in cold Weather this must not be too often repeated, lest it should rot their Fibres.

The 2d Sort hath a strong upright Stalk covered with a purplish Bark dividing into several Branches, which grow erect, and are garnished with broad, shining, silvery, Spear-shaped Leaves placed on every Side, so the Plants make a fine Appearance, when intermixed with other Exoticks. This should be placed in an airy dry Glass Case, where it may be protected from Cold,

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and have as much Light as possible, and in Winter should have little Water; this rises easily from Seeds, which must be procured from the *Cape of Good Hope*, where it grows naturally. The Seeds will sometimes remain in the Ground 6 or 8 Months, and at other Times the Plants will appear in 6 Weeks; therefore the best Way is to sow them in small Pots filled with soft sandy Loam, and plunge them into a moderate hot Bed; and, if the Plants should not come up so soon as expected, the Pots should remain in Shelter till the following Spring, when, if the Seeds remain sound, the Plants will come up. The Pots, in which the Seeds are sown, should have but little Wet, for Moisture frequently causes them to rot. When the Plants appear, they should not be too tenderly treated, for they must not be kept too warm, nor should they have much Wet; but in warm Weather they must be exposed to the open Air in a sheltered Situation, and in Winter protected from Frost.

The 3d Sort I raised from Seeds, which came from the *Cape of Good Hope*; these Seeds were long and slender, very different in shape from those of the 2d Sort, but the Plants have some Resemblance to those. The Leaves are very silky and white; the Stalks purple, and grow erect, but have not as yet put out Branches.

The 1st Sort may be propagated by Cuttings, which should be cut off in *April*, just before the Plants begin to shoot; these should be planted in small Pots filled with light Earth, and plunged into a moderate hot Bed, shading them from the Sun, and now and then gently refreshing them with Water, given sparingly, for much Wet will rot them. These Cuttings will put out Roots by *Midsummer*, when they may be gently shaken out of the Pots, and parted, planting each in a small Pot filled with light Earth, and place them in a Frame, where they may be shaded till they have taken new Root; then they should be gradually inured to the open Air, into which they should be removed, and treated in the same Way as the old Plants.

PRUNELLA. Lin. Sp. Pl. 600. Brunella. Tourn. Inst. Lin. Gen. Plant. 654. Self-heal; in French, Brunelle.

The Characters are,

The Flower has a short permanent Emplacement of one Leaf, divided into 2 Lips; the upper Lip is broad, plain and slightly indented in 3 Parts; it is narrow, erect, and bifid. The Flower is of the Lip Kind with one Petal which has a short cylindrical Tube with oblong Chaps; the upper Lip is concave, entire, and nodding; the under Lip reflexed, trifid, and obtuse; the middle Segment broad, indented, and sawed at the Point. It has 4 Awl-shaped Stamina, 2 of which are longer than the other, with single Summits inserted to the Stamina, under their Points, and a four-parted Germen, supporting a slender Style inclining under the upper Lip, crowned by an indented Stigma. The Germen turns to 4 oval Seeds shut up in the Emplacement.

The Species are,

1. *PRUNELLA foliis ovato-oblongis integris petiolatis* Self-heal with oval oblong entire Leaves having Foot Stalks. This is the *Brunella major folio non dissecto. C. B. P.* Greater Self-heal with an undivided Leaf,

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2. *PRUNELLA foliis oblongo-ovatis dentato-laciniatis* Self-heal with oblong, oval, indented, cut Leaves. This is the *Brunella cæruleo magno flore*. C. B. P. 261. Self heal with a large blue Flower.

3. *PRUNELLA foliis infimis pinnato-incisis, summis integris*. Self-heal whose lower Leaves are cut like Wings, and the upper entire. This is the *Brunella folio laciniato*. C. B. P. 261. Self-heal with cut Leaves.

4. *PRUNELLA foliis lanceolato-linearibus ciliatis subsessilibus*. Saw. Monsp. 141. Self-heal with linear, hairy, cut, Spear-shaped Leaves sitting almost close to the Stalks. This is the *Brunella Hyssopifolia*. C. B. P. 261. Hyssop-leaved Self-heal.

5. *PRUNELLA foliis linearibus, internodiis longissimis, spicis interruptis*. Self-heal with linear Leaves, the Joints of the Stalk far asunder, and interrupted Spikes of Flowers. This is the *Brunella Canadensis, hyssopifolio angustissimo, internodiis longissimis* Jussieu. Canada Self-heal with the narrowest Hyssop Leaves, and the Joints of the Stalks very far asunder.

6. *PRUNELLA foliis oblongis pinnato-incisis villosis, infimis petiolatis summis sessilibus*. Self-heal with oblong Wing-cut Leaves which are hairy, the lower having Foot Stalks, and the upper sitting close to the Stalk. This is the *Brunella folio laciniato, flore sulphureo elegantissimo*. Boerb. Ind. alt. 169. Self-heal with a cut Leaf, and an elegant Sulphur-coloured Flower.

7. *PRUNELLA foliis lineari-lanceolatis pinnato-incisis subsessilibus, spicis interruptis*. Self-heal with linear Spear-shaped Leaves which are cut like Wings setting almost close to the Stalks, and interrupted Spikes of Flowers. *Brunella folio Verbenæ tenuifoliæ*. Boerb. Ind. alt. Self-heal with a Leaf like narrow-leaved Vervain.

8. *PRUNELLA foliis lanceolatis integerrimis infimis petiolatis summis sessilibus, internodiis prælongis, spicis crassioribus*. Self-heal with entire Spear-shaped Leaves, the lower having Foot Stalks, and the upper sitting close to the Stalks, the Joints far asunder, and very thick Spikes of Flowers. This is the *Brunella Caroliniana, magno flore dilute cæruleo, internodiis prælongis*. Afl. Phil. No 395. Carolina Self-heal with a large blue Flower, and the Joints far asunder.

9. *PRUNELLA foliis oblongis mucronatis petiolatis, spicis crassis sessilibus*. Self-heal with oblong acute-pointed Leaves having Foot Stalks, and thick Spikes of Flowers sitting very close to the Leaves. This is the *Brunella Novæ Angliæ major, foliis longis mucronatis*. Afl. Phil. No 395. Greater New England Self-heal, with longer-pointed Leaves.

10. *PRUNELLA foliis pinnato-dentatis, bracteis acute incisis birsutis*. Self-heal with Wing indented Leaves, and hairy acute-cut Bractææ. This is the *Bugula odorata Lusitanica*. Cornut. Canad. 46. Sweet Portugal Bugle.

The 1st Sort grows naturally in Pastures, in most Parts of England; this is the Sort used in Medicine, and is much esteemed as a vulnerary Herb; it has a perennial fibrous Root, from which arise several square Stalks, 8 or 9 Inches high, garnished with oval, oblong, entire Leaves placed opposite on Foot Stalks; they are an Inch and a Half long, and 3 Quarters of an Inch broad, of a brownish Colour. The Flowers are disposed in a short close Spike; the most common Colour of the Flower is purple, but it is sometimes found with a white

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one. It flowers in June and July, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in Italy and Germany. The Stalks rise higher than those of the former, the Joints are farther apart, the Leaves are oblong, oval, two Inches and a Half long, and one and a Half broad, placed opposite upon long Foot Stalks, and are jagged and indented on their Edges. The Spike is longer; the Flowers are larger, and of a fine blue Colour. It flowers about the same Time with the first. There is a Variety of this with white Flowers.

The 3d Sort grows naturally in moist Meadows in Germany. The Stalks of this are taller than either of the former; the Leaves are longer and narrower; the lower Leaves are cut almost to the Midrib, in Form of winged Leaves, those on the Middle of the Stalk are cut in the shape of a Halbert, and those on the Top entire. The Flowers are larger than the common Sort and come earlier. There is one with purple, one with white, and a 3d with red Flowers of this Species.

The 4th Sort grows naturally in the South of France and in Italy. The Stalks are slender, and rise 8 or 9 Inches high. The Leaves are 2 Inches long, and a Quarter of an Inch broad, smooth, and sit close to the Stalks. The Flowers are of a bright purple Colour, have large Bractææ, and appear in June.

The 5th Sort grows naturally in Canada. The Stalks rise a Foot and a Half high, are smooth and entire, 2 Inches long, and an Eighth of an Inch broad, ending in acute Points; these are placed opposite, sitting close to the Stalks, whose Joints are far asunder. The Flowers are of a red purple Colour placed in whorled Spikes at the Top of the Stalks having small Spaces between the Whorls. This flowers in June, and the Seeds ripen in August.

The 6th Sort grows naturally in Austria: This is a biennial Plant. The Stalks rise about a Foot high, sending out Branches opposite from the lower Part; they are hairy, and garnished with oblong Leaves cut in Form of Wings. The lower Leaves stand on long Foot Stalks, but the upper sit close to the Stalks. The Flowers are produced in close Spikes at the Top of the Stalks; they are of a Brimstone Colour, and have hairy acute-pointed Bractææ. It flowers in July, and the Seeds ripen in Autumn.

The 7th Sort grows naturally in Bohemia. The Stalks rise a Foot and a Half high. The Joints are pretty far asunder, the lower Leaves are near 3 Inches long, and a Quarter of an Inch broad, cut on their Edges in Form of Wings, and sit close to the Stalks. The Flowers grow in interrupted Spikes at the Top of the Stalks; they are purple and larger than those of the common Sort. It flowers in July, and the Seeds ripen in Autumn.

The 8th Sort grows naturally in Carolina; this is a biennial Plant; the Stalk rises a Foot or more in Height; it is purple and hairy. The Leaves are Spear-shaped and entire, about 2 Inches long, and one broad in the Middle, drawing to a Point at each End. The Joints of the Stalks are pretty far asunder; at each of these are placed 2 Leaves opposite; those on the lower Part of the Stalks, have Foot Stalks about an Inch long, but

but the Leaves at the Top sit close to the Stalks, and are narrower than those below. The Flowers are collected in pretty long, close, thick Spikes, which terminate the Stalks, and are of a light blue Colour, appearing in *June*; the Seeds ripen in Autumn.

The 9th Sort grows naturally in *New England*, and *Maryland*. The Stalks are purple, rise a Foot high, and branch out on each Side almost their whole Length. The Leaves are 3 Inches long, and one broad near their Base, gradually diminishing, and ending in long acute Points; they are of a purple brown Colour, and stand on short Foot Stalks. The Flowers are collected in very thick Spikes, sitting close on the Top of the Stalks, they are of a purple Colour, and appear in *July*. The Seeds ripen in Autumn.

The 10th Sort grows naturally in *Spain* and *Portugal*; this is an annual Plant, which decays soon after it has perfected Seeds. The Stalks are about 9 Inches long, four-cornered, hairy, and garnished with oblong Leaves, regularly indented on their Edges like those of Spleenwort; they are 3 Inches long, and half an Inch broad, sitting close to the Stalks. The Flowers are collected into close thick Spikes at the Top of the Stalks; they are of a blue Colour and smell sweet, having Bractæa cut into many acute Points, and very hairy. This flowers in *June* and *July*, and the Seeds ripen in Autumn.

These Plants are propagated by Seeds, which should be sown in Autumn soon after they are ripe, for when they are kept out of the Ground till Spring, the Plants seldom come up the first Year; these may be sown on a Bed of common Earth, (if it is of a loamy Nature the Plants will thrive best) in the Place where the Plants are desired to remain; for as they are only cultivated for Variety, a few of each Sort will be sufficient for that purpose. When these Plants come up, the only Culture they will require, is to thin them where too close, and keep them clean from Weeds.

The perennial Sorts may be continued and increased, by transplanting their Roots, and parting their Offsets; by so doing, they will last several Years; but if not removed every other Year, they are apt to rot.

If the Seeds of these are permitted to scatter, the Plants will come up without Care; but if the several Kinds stand near each other, the scattered Seeds will mix, so that the Sorts cannot be so well preserved as when the Seeds are carefully collected and sown on a Bed where the Sorts have not grown before; for if the Seeds of any of these should have been buried in the Ground before, when they are turned up, they will mix with those which are sown; the not being careful in this Particular, has occasioned several Persons to believe that most of the Sorts were only accidental Varieties, because they have frequently found 2 or 3 different Species arise, where they had sown but one, and these they imagined were produced from the same Seeds; whereas those which were different arose from scattered Seeds; and in many Instances I have found it impossible to keep the Species of Plants distinct in Gardens, where they are ranged in Classes.

PRUNING OF TREES. There is not any Part of Gardening of more general Use than that of Pruning, and yet it is very rare to see Fruit Trees skilfully managed. Almost every Gardener will pretend to

be a Master of this Business, though there are but few who rightly understand it, nor is it to be learned by Rote, but requires a strict Observation of the different Manners of Growth of the several Sorts of Fruit Trees, some requiring to be managed one Way, and others to be treated in a quite different Method, which is only to be known by carefully observing how each Kind is naturally disposed to produce its Fruit; for some Sorts produce their Fruit on the same Year's Wood, as Vines; others produce their Fruit, for the most part, upon the former Year's Wood, as Peaches, Nectarines, &c. and others upon Cursons or Spurs, which are produced upon Wood of three, four, or five, to fifteen or twenty Years old, as Pears, Plums, Cherries, &c. therefore, in order to the right Management of Fruit Trees, care should be taken to procure a sufficient Quantity of bearing Wood in every Part of the Trees, and at the same Time there should not be a Superfluity of useless Branches, which would exhaust the Strength of the Trees, and cause them to decay in a few Years.

The Reasons which have been laid down for pruning Fruit Trees are as follow; First, To preserve Trees longer in a vigorous bearing State; second, To render the Trees more beautiful to the Eye; and thirdly, To cause the Fruit to be larger, and better tasted.

1. It preserves a Tree longer in a healthy bearing State; for by pruning off all superfluous Branches, so that there are no more left upon the Tree than are necessary, or than can be properly nourished, the Root is not exhausted in supplying useless Branches, which must afterwards be cut out, whereby much of the Sap will be uselessly expended.

2. By skilful Pruning a Tree it is rendered much more pleasing to the Eye, but here I would not be understood to be an Advocate for a Sort of Pruning; which I have seen too much practised of late, *viz.* the drawing a regular Line against the Wall, according to the Shape or Figure they would reduce the Tree to; and cutting all the Branches, strong or weak, exactly to the chalked Line; the Absurdity of which Practice will soon appear to every one who will be at the Pains of observing the Difference of those Branches shooting the succeeding Spring. All therefore that I mean by rendering a Tree beautiful is, that the Branches are all pruned according to their several Strengths, and are nailed at equal Distances, in Proportion to the different Sizes of their Leaves and Fruit, and that no Part of the Wall (so far as the Trees are advanced) be left unfurnished with bearing Wood. A Tree well managed, though it does not represent any regular Figure, yet will appear very beautiful to the Sight, when it is thus dressed, and nailed to the Wall.

3. It is of great Advantage to the Fruit; for the cutting away all useless Branches, and shortening all the bearing Shoots according to the Strength of the Tree, will render the Tree more capable to nourish those which are left remaining, so that the Fruit will be much larger, and better tasted. This is the Advantage which the Trees against Walls or Espaliers have over Standards, which are permitted to grow as they are naturally inclined; for it is not their being trained either to a Wall or Espalier which renders their Fruit so much better than Standards, but because the Roots have a less Quantity of Branches

Branches and Fruit to nourish, and consequently their Fruit will be larger, and better tasted.

The Reasons for pruning being thus exhibited, the next Thing is the Method of performing it, but this being fully handled under the several Articles of the different Kinds of Fruit, I shall not repeat it again in this Place, and therefore shall only add some few general Instructions, which are necessary to be understood, in order to the right Management of Fruit Trees.

There are many Persons who suppose that, if their Fruit Trees are but kept up to the Wall or Espalier, during the Summer Season, so as not to hang in very great Disorder, and in Winter to get a Gardener to prune them, it is sufficient, but this is a Mistake; for the greatest Care ought to be employed about them in the Spring, when the Trees are in vigorous Growth, which is the only proper Season to procure a Quantity of good Wood in the different Parts of the Tree, and to displace all useless Branches as soon as they are produced, whereby the Vigour of the Tree will be entirely distributed to such Branches only as are designed to remain, which will render them strong, and more capable to produce good Fruit; whereas, if all the Branches are permitted to remain which are produced, some of the more vigorous will attract the greatest Share of the Sap from the Tree, whereby they will be too luxuriant for producing Fruit, and the greatest Part of the other Shoots will be starved, and rendered so weak, as not to be able to produce any Thing else but Blossoms and Leaves (as hath been before mentioned); so that it is impossible for a Person, let him be ever so well skilled in Fruit Trees, to reduce them into any tolerable Order by Winter-pruning only, if they are wholly neglected in the Spring.

There are others who do not entirely neglect their Trees during the Summer Season, but yet do little more Good to them by what they call Summer-pruning; for these Persons neglect their Trees at the proper Season, which is in *April* and *May*, when their Shoots are produced, and only about *Midsummer* go over them, nailing in all their Branches, except such as are produced fore-right from the Wall, which they cut out, and at the same Time often shorten most of the other Branches; all which is entirely a wrong Practice, for those Branches, which are intended for bearing the succeeding Year, should not be shortened during the Time of their Growth, which will cause them to produce one or two lateral Shoots from the Eyes below the Place where they were stopped, which Shoots will draw much of the Strength from the Buds of the first Shoot, whereby they are often flat, and do not produce their Blossoms; and, if those two lateral Shoots are not entirely cut away at the Winter-pruning, they will prove injurious to the Tree, as the Shoots which these produce, will be what the *French* call *Water Shoots*; and in suffering those luxuriant Shoots to remain upon the Tree until *Midsummer* before they are displaced, they will exhaust a great Share of the Nourishment from the other Branches (as was before observed); and by shading the Fruit all the Spring Season, when they are cut away and the other Branches fastened to the Wall, the Fruit, by being so suddenly exposed, will receive a very great Check, which will cause their Skins to grow tough, and thereby render

them less delicate. This is to be chiefly understood of Stone Fruit and Grapes, but Pears and Apples, being much hardier, suffer not so much, though it is a great Disadvantage to those also to be thus managed.

It must also be remarked, that Peaches, Nectarines, Apricots, Cherries, and Plums, are always in the greatest Vigour, when they are the least maimed by the Knife, for where these Trees have large Amputations, they are very subject to gum and decay; so that it is certainly the most prudent Method carefully to rub off all useless Buds when they are first produced, and pinch others, where new Shoots are wanted to supply the Vacancies of the Wall, by which Management Trees may be so ordered, as to want but little of the Knife in Winter-pruning, which is the surest Way to preserve these Trees healthful, and is performed with less Trouble than the common Method.

The Management of Pears and Apples is much the same with these Trees in Summer, but in Winter they must be very differently pruned; for as Peaches and Nectarines for the most part produce their Fruit upon the former Year's Wood, therefore they must have their Branches shortened, according to their Strength, in order to produce new Shoots for the succeeding Year; so Pears, Apples, Plums, and Cherries, on the contrary producing their Fruit upon Curls or Spurs, which come out of the Wood of five, six, or seven Years old, should not be shortened, because thereby those Buds, which were naturally disposed to form these Curls or Spurs, would produce Wood Branches, whereby the Trees would be filled with Wood, but never produce much Fruit; and, as it often happens that the Blossom Buds are first produced at the Extremity of the last Year's Shoot, by shortning the Branches, the Blossoms are cut away, which should always be carefully avoided.

There are several Authors who have written on the Subject of Pruning in such a prolix Manner, that it is impossible for a Learner to understand their Meaning. These have described the several Sorts of Branches, which are produced on Fruit Trees; as Wood Branches, Fruit Branches, irregular Branches, false Branches, and luxuriant Branches, all which they assert every Person, who pretends to Pruning, should distinguish well; whereas there is nothing more in all this but a Parcel of Words to amuse the Reader, without any real Meaning; for all these are comprehended under the Description already given of luxuriant or useless Branches, and such as are termed useful or Fruit-bearing Branches; and, where due care is taken in the Spring of the Year to displace these useless Branches (as was before directed), there will be no such Thing as irregular, false, or luxuriant Branches at the Winter pruning, therefore it is to no Purpose to amuse People with a Cant of Words, which, when fully understood, signify just nothing at all.

But since I have explained the different Methods of pruning the several Sorts of Fruits under the respective Articles, I shall forbear repeating it again in this Place, but shall only give some general Hints for the pruning of Standard Fruit Trees, and so conclude.

First, you should never shorten the Branches of these Trees, unless it be where they are very luxuriant, and grow irregular on one Side of the Tree, attracting

the greatest Part of the Sap of the Tree, whereby the other Parts are unfurnished with Branches, or rendered very weak, in which Case the Branch should be shortened down as low as is necessary, in order to obtain more Branches, to fill up the Hollow of the Trees; but this is only to be understood of Pears and Apples, which will produce Shoots from Wood of three, four, or more Years old, whereas most Sorts of Stone Fruit will gum and decay after such Amputations.

But from hence I would not have it understood, that I would direct reducing these Trees into an exact spherical Figure, since there is nothing more detestable than to see a Tree (which should be permitted to grow as it is naturally disposed, with its Branches produced at proportionable Distances, according to the Size of the Fruit), by endeavouring to make it exactly regular at its Head, so crowded with small weak Branches as to prevent the Air from passing between them, which will render it incapable to produce Fruit. All that I intend by this stopping of luxuriant Branches, is only when one or two such happen on a young Tree, where they entirely draw all the Sap from the weaker Branches, and then starve them, and then it is proper to use this Method, which should be done in Time, before they have exhausted the Roots too much.

When this happens to Stone Fruit, which suffer much more by cutting than the former Sorts, it should be remedied by stopping or pinching those Shoots in the Spring, before they have obtained too much Vigour, which will cause them to push out side Branches, whereby the Sap will be diverted from ascending too fast to the leading Branch (as hath been directed for Wall Trees), but this must be done with Caution.

You must also cut out all dead or decaying Branches, which cause their Heads to look very ragged, especially at the Time when the Leaves are upon the Tree, these being destitute of them, have but a despicable Appearance; besides, these will attract noxious Particles from the Air, which are injurious to the Trees, therefore the sooner they are cut out, the better. In doing this you should observe to cut them close down to the Place where they were produced, otherwise that Part of the Branch left will decay, and prove equally hurtful to the Tree; for it seldom happens, when a Branch begins to decay, that it does not die quite down to the Place where it was produced, and, if permitted to remain long uncut, does often infect some of the other Parts of the Tree. If the Branches are large which you cut off, it will be very proper, after having smoothed the cut Part exactly even with a Knife, Chisel or Hatchet, to put on a Plaster of grafting Clay, which will prevent the Wet from soaking into the Tree at the wounded Part.

All such Branches as cross each other should also be cut out, for these not only occasion a Confusion in the Head of the Tree, but, by lying over each other, rub off their Bark by their Motion, and very often occasion them to canker to the great Injury of the Tree, and on old Trees (especially Apples) there are often young vigorous Shoots from the old Branches near the Trunk, which grow upright into the Head of the Trees. These therefore should carefully be cut out every Year, lest, by being permitted to grow, they fill the Tree too full

of Wood, which should always be guarded against, since it is impossible for such Trees to produce so much, or so good Fruit as those, whose Branches grow at a farther Distance, whereby the Sun and Air freely pass between them in every Part of the Tree.

These are all the general Directions which are proper to be given in this Place, since not only the particular Methods, but also the proper Seasons for pruning all the different Kinds of Fruit, are fully exhibited under their several Articles.

PRUNUS. *Tourn. Inst. R. H. 622. Tab. 393. Lin. Gen. Plant. 546.* The Plum Tree.

The Characters are,

The Flower hath a Bell-shaped Empalement of one Leaf cut into 5 Points; it hath 5 large roundish Petals which spread open, and are inserted in the Empalement, and from 20 to 30 Stamina, which are near as long as the Petals, and are also inserted in the Empalement, terminated by Twin Summits. It has a roundish Germen, supporting a slender Style, crowned by an orbicular Stigma. The Germen turns to a roundish Fruit inclosing a Nut of the same Form.

I shall now mention the Varieties of this Fruit which are cultivated in the English Gardens.

The Species are,

1. PRUNUS *fructu parvo præcoci. Tourn.* The Jean-hâtive, or white Primordian; this is a small longish white Plum, of a clear yellow Colour, covered over with a white Flew, which easily wipes off. The Juice is sweet, is a pretty good Bearer, and, for its coming very early, may have a Place in a large Garden of Fruit, but it is mealy, and has little Flavour. This ripens the Middle of July.

2. PRUNUS *fructu magno crasso subacido. Tourn.* Damas noir hâtive, i. e. the early black Damask, commonly called the Moracco Plum; this is a pretty large Plum, of a round Shape, divided with a Furrow in the Middle (like Peaches). The Outside is of a dark black Colour, covered with a light Violet Bloom; the Flesh is yellow, and parts from the Stone. It ripens in the Middle of July, and is esteemed for its Goodness.

3. PRUNUS *fructu parvo dulci atro-cæruleo. Tourn.* The little black Damask Plum; this is a small black Plum covered with a light Violet Bloom. The Juice is richly sugared; the Flesh Parts from the Stone, and it is a good Bearer. Ripe the latter End of July.

4. PRUNUS *fructu magno dulci atro-cæruleo. Tourn.* Gros Damas Violet de Tours, i. e. great Damask Violet of Tours; this is a pretty large Plum inclining to an oval Shape. The Outside is of a dark blue covered with a Violet Bloom; the Juice is richly sugared; the Flesh is yellow, and parts from the Stone. Ripe the End of July.

5. PRUNUS *fructu rotundo atro-rubente.* The Orleans Plum. The Fruit is so well known to almost every Person, that it is needless to describe it; it is a very plentiful Bearer, which has occasioned its being so generally planted by those Persons who supply the Markets with Fruit, but it is an indifferent Plum. It ripens the Beginning of August.

6. PRUNUS *fructu oblongo atro-rubente.* The Fotheringham Plum; this Fruit is somewhat long, deeply furrowed in the Middle. The Flesh is firm, and parts from

from the Stone; the Juice is very rich. This ripens about the Beginning of *August*.

7. *PRUNUS fructu nigro, carne durâ. Tourn.* The Perdigron Plum; this is a middle-sized Plum of an oval Shape. The Outside is of a very dark Colour covered over with a Violet Bloom; the Flesh is firm, and full of an excellent rich Juice. This is greatly esteemed by the Curious. Ripe the middle of *August*.

8. *PRUNUS fructu magno & violaceo rubente suavissimo saccharato. Tourn.* The Violet Perdigron Plum; this is a large Fruit, rather round than long, of a bluish red Colour on the Outside. The Flesh is of a yellowish Colour, pretty firm, and closely adheres to the Stone; the Juice is of an exquisite rich Flavour. This ripens the Middle of *August*.

9. *PRUNUS fructu ovato ex albo flavescente.* The white Perdigron Plum; this is a middling Plum of an oblong Figure. The Outside is yellow, covered with a white Bloom; the Flesh is firm, and well tasted. It is a very good Fruit to eat raw, or for Sweet meats, having an agreeable Sweetness mixed with an Acidity. It ripens the End of *August*.

10. *PRUNUS fructu ovato magno rubente Tourn.* The red imperial Plum, sometimes called the red Bonum Magnum; this is a large oval-shaped Fruit, of a deep red Colour, covered with a fine Bloom. The Flesh is very dry, and very indifferent to be eaten raw, but is excellent for making Sweetmeats: This is a great Bearer. Ripe the End of *August*.

11. *PRUNUS fructu ovato magno flavescente. Tourn.* White imperial Bonum Magnum, white Holland or Mogul Plum; this is a large oval-shaped Fruit, of a yellowish Colour, powdered over with a white Bloom. The Flesh is firm, and adheres closely to the Stone; the Juice is of an acid Taste, which renders it unpleasant to be eaten raw, but it is very good for baking or Sweetmeats. It is a great Bearer, and is ripe the Middle of *September*.

12. *PRUNUS fructu ovato cœruleo.* The Cheston Plum; this is a middle-sized Fruit of an oval Figure. The Outside is of a dark blue, powdered over with a Violet Bloom; the Juice is rich, and it is a great Bearer. Ripe the Middle of *September*.

13. *PRUNUS fructu maximo rotundo flavo & dulci. Tourn.* Prune d'Abricot, *i. e.* the Apricot Plum; this is a large round Fruit of a yellow Colour on the Outside, powdered over with a white Bloom. The Flesh is firm and dry, of a sweet Taste, and comes clean from the Stone. This ripens the End of *September*.

14. *PRUNUS fructu subrotundo, ex rubro & flavo mixto.* The Maître Claude. Although this Name is applied to this Fruit, yet it is not what the French so call. This is a middle-sized Fruit, rather round than long, of a fine mixed Colour between red and yellow. The Flesh is firm, parts from the Stone, and has a delicate Flavour. Ripe the End of *August*.

15. *PRUNUS fructu rubente dulcissimo. Tourn.* La Rochecourbon, or Diaprée rouge, *i. e.* the red Diaper Plum; this is a large round Fruit, of a reddish Colour, powdered over with a Violet Bloom; the Flesh adheres closely to the Stone, and is of a very high Flavour. Ripe the End of *August*.

16. *PRUNUS fructu rotundo flavescente, La petite Reine*

Claude, *i. e.* The little Queen Claudia. This is a small round Fruit, of a whitish yellowish Colour, powdered over with a Pearl-coloured Bloom; the Flesh is firm and thick, quits the Stone, and its Juice is richly sugared. Ripe the End of *August*.

17. *PRUNUS fructu rotundo nigro-purpureo majori dulci. Tourn.* Myrobalan Plum. This is a middle sized Fruit, of a round Shape; the Outside is a dark purple, powdered over with a Violet Bloom; the Juice is very sweet. It is ripe the End of *August*.

18. *PRUNUS fructu rotundo & viridi flavescente, carne dura suavissimo.* La grosse Reine Claude, *i. e.* the large Queen Claudia, by some the Dauphiny. At *Tours* it is called the Abricot verd, *i. e.* green Apricot; at *Rouen*, Le verte bonne, *i. e.* the good green; and in other Places, Damas verd, *i. e.* green Damask or Trompvalet, the Servants Cheat. This is one of the best Plums in *England*; it is of a middle Size, round, and of a yellowish green Colour on the Outside; the Flesh is firm, of a deep green Colour, and parts from the Stone; the Juice has an exceeding rich Flavour, and it is a great Bearer. Ripe the Middle of *September*. This Plum is confounded by most People in *England*, by the Name of Green Gage, but this is the Sort which should be chosen, although there are three or four different Sorts of Plums generally sold for it, one of which is small, round, and dry; this quits the Stone, and is later ripe so is not worth preserving.

19. *PRUNUS fructu amygdalino. Tourn.* Rognon de Coq, *i. e.* Cock's Testicles. This is an oblong Fruit, deeply furrowed in the Middle, so as to resemble the Testicles; it is of a whitish Colour on the Outside, streaked with red; the Flesh of it adheres firmly to the Stone, and it is late ripe.

20. *PRUNUS fructu rotundo flavo dulcissimo.* Drap d'Or, *i. e.* the Cloth of Gold Plum. This is a middle sized Fruit, of a bright yellow Colour, spotted or streaked with red on the Outside; the Flesh is yellow, and full of and excellent Juice. It is a plentiful Bearer, and ripens about the Middle of *September*.

21. *PRUNUS fructu cerci coloris. Tourn.* Prune de Sainte Catharine, *i. e.* St Catharine Plum. This is a large oval-shaped Fruit, somewhat flat; the Outside is of an Amber Colour, powdered over with a whitish Bloom, but the Flesh is of a bright yellow Colour, is dry and firm, adheres closely to the Stone, and has a very agreeable sweet Taste. This ripens at the End of *September*, and is very subject to dry upon the Tree, when the Autumn proves warm and dry. This makes fine Sweetmeats, and is a plentiful Bearer.

22. *PRUNUS fructu ovato rubente dulci.* The Royal Plum. This is a large Fruit of an oval Shape, drawing to a Point next the Stalk; the Outside is of a light red Colour, powdered over with a whitish Bloom; the Flesh adheres to the Stone, and has a fine sugary Juice. This ripens the Middle of *September*.

23. *PRUNUS fructu parvo ex viridi flavescente. Tourn.* La Mirabelle. This is a small round Fruit, of a greenish yellow on the Outside; the Flesh parts from the Stone, is of a bright yellow Colour, and has a fine sugary Juice. This is a great Bearer, ripens the End of *August*, and is excellent for Sweetmeats.

24. *PRUNUS Brigoniensis, fructu suavissimo. Tourn.*
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Prune de Brignole, i. e. the Brignole Plum. This is a large oval-shaped Fruit, of a yellowish Colour, mixed with red on the Outside; the Flesh is of a bright yellow Colour, is dry, and of an excellent rich Flavour. This ripens the Middle of September, and is esteemed the best Plum for Sweetmeats yet known.

25. *PRUNUS fructu magno à violaceo rubente serotino.* Tourn. Imperatrice, i. e. the Empress. This is a large round Fruit, of a Violet red Colour, very much powdered with a whitish Bloom; the Flesh is yellow, cleaves to the Stone, and is of an agreeable Flavour. This ripens about the Beginning of October.

26. *PRUNUS fructu ovato maximo flavo.* Tourn. Prune de Monsieur, i. e. Monsieur's Plum. This is sometimes called the Wentworth Plum. It is a large oval-shaped Fruit, of a yellow Colour both with in and without, very much resembling the Bonum Magnum, but the Flesh of this parts from the Stone, which the other doth not. This ripens towards the latter End of September, and is very good to preserve, but the Juice is too sharp to be eaten raw. It is a great Bearer.

27. *PRUNUS fructu majori rotundo rubro.* Tourn. Prune Cerizette, i. e. the Cherry Plum. This Fruit is commonly about the Size of the Ox heart Cherry; is round, and of a red Colour; the Stalk is long like that of a Cherry, which this Fruit so much resembles, as not to be distinguished therefrom at some Distance. The Blossoms of this Tree come out very early in the Spring, and being tender, are very often destroyed by Cold, but it affords a very agreeable Prospect in the Spring; for these Trees are generally covered with Flowers, which open about the same Time as the Almonds; so that when they are intermixed therewith, they make a beautiful Appearance before many other Sorts put out; but by this blossoming so early there are few Years that they have much Fruit.

28. *PRUNUS fructu albo oblongiusculo acido.* Tourn. The white Pear Plum. This is a good Fruit for Preserving, but it is very unpleasant if eaten Raw; it is very late ripe, and seldom planted in Gardens, unless for Stocks to bud some tender Sorts of Peaches upon, for which Purpose it is esteemed the best amongst all the Sorts of Plums.

29. *PRUNUS Mytellinum.* Park. The Musclee Plum. This is an oblong flat Plum, of a dark red Colour; the Stone is large, and the Flesh but very thin and not well tasted, so that its chief Use is for Stocks, as the former.

30. *PRUNUS fructu parvo violaceo.* The St. Julian Plum. This is a small Fruit, of a dark Violet Colour, powdered over with a mealy Bloom; the Flesh adheres closely to the Stone, and in a fine Autumn will dry up on the Tree. The chief Use of this Plum is for Stocks, to bud the more generous Kinds of Plums and Peaches upon; as also for the Bruxelles Apricot, which will not thrive so well upon any other Stock.

31. *PRUNUS sylvestris major.* J. B. The black Bullace Tree. This grows wild in the Hedges in divers Parts of England, and is rarely cultivated in Gardens.

32. *Prunus sylvestris, fructu majore albo.* Raii. Syn. The white Bullace Tree. This grows wild as the former, and is seldom cultivated in Gardens.

33. *PRUNUS sylvestris.* Ger. Emac. The Black-thorn, or Sloe Tree. This is very common in the Hedges al-

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most every where; the chief Use of this Tree is to plant for Hedges, as White-thorn, &c. and being of quick Growth, is very proper for that Purpose.

All the Sorts of Plums are propagated by budding or grafting them upon Stalks of the Musclee, White Pear, St. Julian, Bonum Magnum, or any other Sorts of free-shooting Plums. The Manner of raising these Stocks been already exhibited under the Article of Nurseries, therefore need not be repeated again; but I would observe, that Budding is much preferable to Grafting for these Sorts of Fruit Trees, which are very apt to gum, where there are large Wounds made on them.

The Trees should not be more than one Year's Growth from the Bud when they are transplanted, for if they are older, they seldom succeed so well, being very subject to canker; or if they take well to the Ground, commonly produce only two or three luxuriant Branches, therefore it is much more advisable to choose young Plants.

The Manner of preparing the Ground (if for Walls) is the same as for Peaches; as is also the pruning the Roots and planting. The Distance which these Trees should be planted at, must not be less than 24 Feet against high Walls, and if the Wall is low, they should be placed 30 Feet asunder.

Plums should have a middling Soil, neither too wet and heavy, nor over-light and dry, in either of which Extremes they seldom do well; and those Sorts which are planted against Walls, should be placed to an East or South East Aspect; which is more kindly to these Fruits than a full South Aspect, on which they are subject to shrivel, and be very dry; and many Sorts will be extreme mealy, if exposed to much too the Heat of the Sun; but most Sorts will ripen extremely well on Espaliers, if rightly managed.

Some Persons plant Plums for Standards, in which Method some of the ordinary Sorts will bear very well; but then the Fruit will not be near so fair as those produced on Espaliers, and will be more in Danger of being bruised or blown down by strong Winds. The Distance of placing them for Espaliers must be the same as against Walls, as also their Pruning or Management; so that whatever may be hereafter mentioned for one, should be likewise understood for both.

Plums do not only produce their Fruit upon the last Year's Wood, but also upon Cursons or Spurs, which come out of Wood that is many Years old; so that there is not a Necessity of shortning the Branches, in order to obtain new Shoots annually in every Part of the Tree (as in Peaches, Nectarines, &c. hath been directed), since the more these Trees are pruned, the more luxuriant they grow, until the Strength of them is exhausted, and then they gum and spoil; therefore the safest Method to manage these Trees is, to lay in their Shoots horizontally, as they are produced, at equal Distances, in Proportion to the Length of their Leaves; and where there is not a sufficient Quantity of Branches to fill up the Vacancies of the Tree, there the Shoots may be pinched the Beginning of May (in the Manner as hath been directed for Peaches, &c.); which will cause them to produce some lateral Branches to supply those Places; and during the growing Season, all fore-right Shoots should be displaced, and such as are to

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to remain must be regularly trained to the Wall or Espalier, which will only not render them beautiful, but also give to each an equal advantage of Sun and Air; and hereby the Fruit will be always kept in a growing State, which they seldom are, when over-shaded with Shoots some Part of the Season, and then suddenly exposed to the Air, by taking off or training those Branches in their proper Position.

With thus carefully going over these Trees in the growing Season, there will be but little Occasion for cutting them in Winter; which (as I before have said) is of ill Consequence to all Sorts of Stone Fruit; for when the Branches are shortened, the Fruit is cut away, and the Number of Shoots increased; for whenever a Branch is shortened, there are commonly two or more Shoots produced from the Eyes immediately below the Cut; so that by thus unskillfully pruning, many Persons crowd their Trees with Branches, and thereby render what little Fruit the Trees produce, very small and ill tasted; which is very commonly found in too many Gardens, where the Manager, perhaps, thinks himself a complete Master of his Business. For nothing is more common, than to see every Branch of a Fruit Tree pass the Discipline of the Knife, however agreeable it be to the several Sorts of Fruits. And it is common to see these Trees planted at the Distance of 14 or 16 Feet, so that the Walls are in a few Years covered with Branches; and then all the Shoots are cut and mangled with the Knife, so as to appear like a stumped Hedge, and produce little Fruit; therefore the only Way to have Plum Trees in good Order, is to give them Room, and extend their Branches at full Length.

Those few Rules will be sufficient, if due Observation be joined therewith to instruct any Person in the right Management of these Sorts of Fruit Trees; therefore I shall not say any more on that Subject, lest by multiplying Instructions, it may render it more obscure to a Learner.

PSEUDOACACIA. See Robinia.

PSEUDODICTAMNUS. See Marrubium.

PSIDIUM. Lin. Gen. Plant. 541. *Guajava*. Tourn. Inst. R. H. 660. Tab. 443. The Guava.

The Characters are,

The Flower has a Bell-shaped Empalement of one Leaf, divided into 5 oval Points at the Top. It hath 5 oval concave spreading Petals indented in the Empalement, with a great Number of Stamina which are shorter than the Petals, and are inserted in the Empalement, terminated by small Summits. It has a roundish Germen situated under the Flower, supporting a long Awl-shaped Style, crowned by a simple Stigma; the Germen becomes a large oval Fruit crowned by the Empalement, inclosing a great Number of small Seeds.

The Species are,

1. *PSIDIUM ramis angulosis, foliis ovatis venosis, fructu majori.* Psidium with angular Branches, oval veined Leaves, and a larger Fruit. This is the *Guajava rubra acida, fructu rotundiori*. H. L. The red Guava with a rounder Fruit.

2. *PSIDIUM foliis oblongo-ovatis venosis, fructu parvo odorato.* Psidium with oblong oval Leaves which are veined, and a small sweet-scented Fruit.

Both these Sorts grow naturally in the *East and West-Indies*, and there is also a third with a large white Fruit, but I do not know whether this is a Variety of the com-

mon Guava, or of that with the small white Fruit; though I am inclined to believe it is the former, because I have raised many Plants from the Seeds of the small white Guava, which have produced Fruit in the *Cbelsea Garden*, and have not varied from their Parent Plant.

The common red Guava hath a thick Trunk, which rises 20 Feet high, covered with a smooth Bark, and divides into many Branches toward the Top; these are angular, and are garnished with oval Leaves, 2 Inches and a Half long, and one Inch and a Half broad in the Middle, rounded at both Ends; they have a strong Midrib, and many Veins running toward the Sides, of a light green Colour, standing opposite upon very short Foot Stalks. From the Wings of the Leaves the Flowers come out upon Foot Stalks, about an Inch and a Half long; they are composed of 5 large, roundish, concave, white Petals, inserted in the Empalement, and within these are a great Number of Stamina which are shorter than the Petals, terminated by small Summits; these Stamina are also inserted in the Empalement. Under the Flower is situated a roundish Germen, supporting a very long Awl-shaped Style, crowned by a simple Stigma. After the Flower is past, the Germen becomes a large oval Fruit, shaped like a Pomegranate, having one Cell, crowned by the Empalement of the Flower, and filled with small Seeds; the Fruit, when ripe, has an agreeable Odour. They are much eaten in the *West-Indies*, both by Men and Beasts; and the Seeds which pass whole through the Body, and are voided with the Excrement grow, where by the Trees are spread over the Ground, where they are permitted to grow. This Fruit is very astringent, and nearly of the same Quality with the Pomegranate, so should be avoided by those Persons who are subject to be costive.

The large white Sort grows naturally in the Islands of the *West-Indies*, and is often found intermixed with the former, so is supposed to be only an accidental Variety arising from the same Seeds. This differs from the former, in the Colour of the Mid-rib of the Leaves, which in this are pale, but those of the former are red. The Flowers and Fruit of this are larger, and the Inside of the Fruit is white.

The Leaves of the small white Guava, are like those of the larger, but the Branches of the Tree are not so angular; the Flowers are much smaller, and the Fruit is no larger than a middling Gooseberry, but when ripe has a very strong aromack Flavour. This flowers in June, and the Fruit ripens in Autumn.

These Plants are propagated by Seeds, which must be procured from the Countries where they naturally grow; if these are brought over in the entire Fruit, gathered full ripe, the Seeds will more certainly succeed; these should be sown in Pots filled with rich Kitchen Garden Earth, and plunged into a hot Bed of Tanners Bark, giving them Water from Time to Time as the Earth dries; in about six Weeks the Plants will appear (if the Seeds are good) and must have free Air admitted to them in Proportion to the Warmth of the Season; when the Plants have obtained Strength enough to remove, they should be each planted in a small Pot, filled with the like rich Earth, and plunged into a fresh hot Bed, shading them from the Sun until they have taken new Root; then they should have a large Share of free

Air

Air admitted to them every Day in warm Weather, to prevent their drawing up weak; they must also be frequently refreshed with Water in Summer. When the Plants have filled these small Pots with their Roots, they should be shaken out, and their Roots pared, then put into larger Pots filled with the same Sort of Earth, and plunged into the hot Bed again, where they should remain till Autumn, when they must be plunged into the Tan Bed in the Stove: During the Winter they should have a moderate Warmth, and not too much Water, and in Summer they will require Plenty of Wet, and in hot Weather a great Share of Air; with this Management the Plants will produce Flowers and Fruit the third Year, and may be continued a long Time.

PSORALEA. Lin. Gen. Plant. 801. Flor. Leyd. Prod. 372. Barba Jovis. Boerb. Ind. alt. 2. 40.

The Characters are,

The Empalement of the Flower is of one Leaf, cut into five Parts, the lower Segments being twice the Length of the other. The Flower is of the Butterfly Kind, it hath five Petals; the Standard is roundish, and indented at the Top. The Wings are small, obtuse, and Moon-shaped; the Keel is Moon-shaped, and composed of two Petals. It hath nine Stamina joined together, and one bristly Stamina standing separate, terminated by roundish Summits, with a linear Germen supporting an Awl-shaped rising Style, crowned by an obtuse Stigma. The Germen afterward turns to a slender compressed Pod, inclosing one Kidney-shaped Seed.

The Species are,

1. PSORALEA foliis pinnatis, floribus axillaribus. Hort. Upsal. 225. Pforalea with winged Leaves and Flowers proceeding from the Sides of the Stalks. This is the Barba Jovis Africana, foliis viridibus pinnatis, flore caeruleo. Boerb. Ind. alt. 2. p. 40. African Jupiter's Beard, with green winged Leaves and a blue Flower.

2. PSORALEA foliis simplicibus ovatis. Hort. Upsal. 225. Pforalea with single oval Leaves. This is the Dorycnium foliis simplicibus ovatis, Prod. Leyd. 389. Dorycnium with single oval Leaves.

3. PSORALEA foliis ternatis, foliolis ovatis, caule fruticoso hirsuto, floribus spicatis terminalibus. Pforalea with trifoliate oval Leaves, a hairy shrubby Stalk, and Flowers growing in Spikes terminating the Branches. Barba Jovis Americana frutescens, foliis subrotundis floribus spicatis purpureis. Houst. Mss. Shrubby American Jupiter's Beard, with roundish Leaves and purple spiked Flowers.

4. PSORALEA foliis pinnatis argenteis, caulibus procumbentibus, floribus axillaribus. Pforalea with silvery winged Leaves, trailing Stalks, and Flowers proceeding from the Sides of the Stalks. Barba Jovis Malabarica annua procumbens argentea, floribus minimis purpureis. Ed. Prior. Annual, trailing, silvery Jupiter's Beard of Malabar, with the least purple Flowers.

5. PSORALEA foliis pinnatis, caule ramofo scandente, floribus alaribus sessilibus. Pforalea with winged Leaves, a climbing branching Stalk, and Flowers sitting close at the Wings of the Stalk. Barba Jovis Americana scandens, floribus caeruleis, ad alas foliorum conglomeratis. Houst. Mss. Climbing American Jupiter's Beard, with blue Flowers growing in Clusters at the Wings of the Leaves.

6. PSORALEA foliis ternatis, caule fruticoso ramossimo, floribus capitatis pedunculatis alaribus. Pforalea with tri-

foliate Leaves, a very branching shrubby Stalk, and Flowers growing in Heads which have Foot Stalks, and proceed from the Wings of the Leaves. This is the Barba Jovis Americana, frutescens hirsuta, floribus caeruleis conglomeratis. Houst. Mss. Shrubby hairy American Jupiter's Beard, with blue clustered Flowers.

7. PSORALEA foliis pinnatis, spicis terminalibus. Lin. Sp. Plant. 764. Pforalea with winged Leaves and Flowers growing in Spikes terminating the Branches. Barba Jovis Americana annua, humilis, ramossissima, floribus caeruleis spicatis. Houst. Mss. Low, very branching, annual, American Jupiter's Beard, with blue spiked Flowers.

8. PSORALEA foliis pinnatis, foliolis rotundioribus villosis, floribus capitatis alaribus terminalibusque, caule fruticoso. Pforalea with winged Leaves having hairy round Lobes, Flowers growing in Heads from the Wings of the Leaves, and at the End of the Branches, and a shrubby Stalk. This is the Barba Jovis Americana, humilis rotundifolia & villosa, flore vario. Houst. Mss. Low American Jupiter's Beard, with a round hairy Leaf and a variable Flower.

9. PSORALEA foliis ternatis, foliolis ovatis, floribus capitatis, pedunculis longissimis. Pforalea with trifoliate Leaves having oval Lobes, and Flowers growing in Heads on very long Foot Stalks. This is the Trifolium bitumen redolens, C. B. P. 327. Trefoil with a bituminous Scent.

10. PSORALEA foliis ternatis, foliolis ovato-lanceolatis, floribus capitatis pedunculis longioribus. Pforalea with trifoliate Leaves having oval Spear shaped Lobes, and Flowers growing in Heads upon long Foot Stalks. This is the Trifolium bitumen redolens angustifolium ac semper-virens. Boerb. Ind. alt. 2. p. 32. Trefoil smelling like Bitumen, with a narrow ever-green Leaf.

The 1st Sort grows naturally at the Cape of Good Hope, from whence I have frequently received the Seeds. This rises with a soft shrubby Stalk 4 or 5 Feet high, dividing into several Branches, garnished with deep green winged Leaves, composed of 3 or 4 Pair of very narrow linear Lobes, terminated by an odd one, standing upon short Foot Stalks, which come out without any Order on every Side the Branches. The Flowers sit very close to the Branches, coming out from the Wings of the Leaves; they are often in Clusters, but arise singly from the Branches. The Standard which is erect and reflexed at the Top, is of a fine blue; the Wings are pale, and the Keel white; these are succeeded by short Pods the Length of the Empalement, each containing one Kidney-shaped Seed. It flowers great Part of Summer, and the Seeds ripen in Autumn. This is easily propagated by Seeds, which should be sown upon a moderate hot Bed, and when the Plants come up, they must not be drawn weak, for as they are not tender, so they should have Air and but little Heat. When they are fit to remove, they should be planted in separate small Pots, filled with light Earth, and plunged again into the Bed, shading them from the Sun till they have taken new Root; then they should be gradually inured to the open Air, into which they should be removed about the Middle of May, and kept abroad till October; then they must be placed in the Green-house, and treated in the same Way as other Plants from the same Country. It may also be propagated by Cuttings, which may be

be planted in any of the Summer Months, on a Bed of light Earth, covering them close with either Bell or Hand Glasses, shading them from the Sun, and gently refreshing them with Water as the Ground dries; when they have taken Root, they must be hardened gradually, then transplanted into small Pots, and treated like the seedling Plants.

The 2d Sort grows naturally in *India*; this is an annual Plant, the Stalks rise a Foot and a Half high, and are garnished at each Joint by one oval Leaf, about 2 Inches long, and one Inch and a Half broad, having one strong Mid-rib, from which come out several Veins, which run toward the Top of the Leaf. The Flowers stand upon long slender Foot Stalks, which come out at the Wings of the Leaves; they are collected into small round Heads, and are of a pale Flesh Colour. It flowers in *July*, and the Seeds ripen in Autumn. This is propagated by Seeds, which must be sown upon a hot Bed in Spring; and when the Plants are fit, they should be planted into separate small Pots filled with light Earth, and plunged into a moderate hot Bed of Tanners Bark, shading them from the Sun till they have taken new Root, after which they must have free Air admitted to them in warm Weather, and gently watered as often as they require it. When the Plants have filled the Pots with their Roots, they should be removed into larger, and the Beginning of *July* they may be removed into an airy Glass Case, where they may be defended from Cold, but should have free Air in warm Weather; with this Care the Plants will flower and ripen their Seeds.

The 3d Sort was discovered by the late Dr. *Houssoun* at *La Vera Cruz*; this rises with a shrubby Stalk 3 or 4 Feet high, sending out a few Side Branches, garnished with oval trifoliate Leaves which are hairy, standing on slender Foot Stalks. The Flowers are collected in Spikes at the End of the Branches, they are of a purple Colour, and are succeeded by short Pods, each containing one Kidney-shaped Seed. It is propagated by Seeds, which must be sown upon a hot Bed, and the Plants afterward treated as the 2d Sort; but as this is an abiding Plant, so they must be removed into the Stove in Autumn, and kept in a moderate Warmth in Winter; in Summer they must have a large Share of Air but should constantly remain in the Stove; the second Year they will produce Flowers, and sometimes their Seeds will ripen in *England*.

The Seeds of the 4th Sort were brought me from *Malabar*; this is an annual Plant, with trailing Stalks about 8 Inches long, garnished with silvery Leaves, composed of 3 or 4 Pair of narrow Lobes, terminated by an odd one. The Flowers grow in small Clusters at the Wings of the Leaves, they are small, and of a purple Colour; the Seed Pods are short, and have one small Kidney-shaped Seed in each. This is propagated by Seeds, in the same Manner as the second Sort.

The 5th Sort was discovered by the late Dr. *Houssoun* at *Campeachy*, where it grows naturally. This hath slender, shrubby, climbing Stalks, which twine about any neighbouring Support, and rise to the Height of 6 or 7 Feet and are garnished with winged Leaves composed of 3 Pair of small, oval, obtuse Lobes, terminated by an odd one. The Flowers come out in small Clusters from

the Wings of the Leaves; they are small, of a bright blue Colour, and are succeeded by short Pods, including one Kidney-shaped Seed.

The 6th Sort was discovered by the same Gentleman, growing naturally at *Campeachy*. This rises with a shrubby Stalk 7 or 8 Feet high, sending out many long slender Branches on every Side, garnished with trifoliate Leaves, whose Lobes are small and Wedge-shaped. The Flowers are produced from the Wings of the Leaves in close small Heads, standing upon pretty long Foot Stalks; they are blue, and are succeeded by short Pods, each, containing a single Kidney-shaped Seed.

These two Sorts are propagated by Seeds sown upon a hot Bed, and when the Plants come up, they must be treated in the same Way as the third Sort.

The 7th Sort was discovered by the late Dr. *Houssoun* at *La Vera Cruz*; this is an annual Plant, with a very branching herbaceous Stalk, rising a Foot and a Half high, spreading wide on every Side, garnished with winged Leaves, composed of 5 or 6 Pair of narrow Wedge-shaped Lobes, terminated by an odd one. The Flowers are collected in close oblong Spikes, terminating the Branches; they are small, of a bright blue Colour, and are succeeded by short Pods, each containing a single Kidney-shaped Seed. This is propagated by Seeds, and requires the same Treatment as the 4th Sort.

The 8th Sort grows naturally at *La Vera Cruz*, from whence the late Dr. *Houssoun* sent the Seeds. This hath an upright shrubby Stalk, which rises 5 or 6 Feet high, having a few Side Branches, closely garnished with winged Leaves, composed of 3 or 4 Pair of small roundish hairy Lobes, terminated by an odd one. The Flowers are collected in small Heads, coming out from the Wings of the Leaves, and at the End of the Branches; they are yellow and red intermixed, and are succeeded by short Pods, containing one Kidney-shaped Seed. This Sort requires the same Treatment as the third.

The 9th Sort grows naturally in the South of *France* and *Italy*; the Root of this is perennial, but the Stalk is not of long Duration, seldom lasting more than two Years; it rises about 2 Feet high, sending out 2 or 3 slender Branches, garnished with trifoliate Leaves, whose Lobes are oval, about 2 Inches long, and one Inch and a Quarter broad, standing upon long Foot Stalks; these, if handled, emit a strong Scent of Bitumen. The Flowers are collected in Heads, and have Foot Stalks 7 or 8 Inches long; they are blue, and are succeeded by short Pods containing one Seed.

The 10th Sort grows naturally in *Sicily*, and also in *Jamaica*, from both which Countries I have received the Seeds. This has been supposed to be the same with the former, but I have many Years propagated both by Seeds, and have never found either of them vary. The Leaves of this are much longer and narrower than those of the former Sort, and are rounded at their Base; the Stalks are shrubby, and of longer Duration; the Heads of Flowers are smaller and the Leaves have not so strong an Odour. These are propagated by Seeds, sown on a Bed of light Earth in *April*, and in *May* the Plants will come up, when they should be kept clean

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from Weeds, and as soon as they are fit to remove, they should be transplanted. Those of the ninth Sort will live through the Winter in the open Air, if they are planted in a warm dry Border; but the tenth Sort requires some Shelter in Winter, so these should be planted in Pots, and put into a common Frame in Winter, where they may be screened from hard Frost. These Plants flower from June to Autumn, and perfect their Seeds annually.

PSYLLIUM. See Plantago.

PTARMICA. See Achillea.

PTELEA. Lin. Gen. Plant. 141. Shrub Trefoil.

The Characters are,

The Empalement of the Flower is small, and cut into 4 acute Parts. The Flower has 4 oval Spear-shaped Petals, which spread open flat; it hath 4 Awl-shaped Stamina terminated by roundish Summits, and an orbicular compressed Germen supporting a short Style crowned by 2 obtuse Stigmas. The Germen becomes a roundish membranaceous Capsule with two Cells, each containing one obtuse Seed.

The Species are,

1. PTELEA foliis ternatis. Lin. Sp. Plant. 118. Ptelea with trifoliate Leaves. This is the *Frutex Virginianus trifolius, ulmi samaris*. Pluk. Alm. 159. Virginia Trefoil Shrub, with Seeds like Elm, commonly called Carolina Shrub Trefoil.

2. PTELEA foliis simplicibus. Lin. Sp. Plant. 118. Ptelea with single Leaves. This is the *Carpinus viscosa, salicis folio integro oblongo*. Burm. Zeyl. Viscous Hornbeam with an entire oblong Willow Leaf. *Staphylodendron Americanum foliis lauri angustis*. Plum. Cat. 18. American Bladder Nut with narrow Bay Leaves.

The 1st Sort grows naturally in North America; it was first discovered in Virginia by Mr. Banister, who sent the Seeds to England, from which some Plants were raised at Fulham, and other curious Gardens, but being planted in the open Air, they were destroyed by a severe Winter, so that there were scarce any of them left here; but in 1724, Mr. Catesby sent over a Quantity of the Seeds from Carolina, which succeeded so well, as to furnish many Gardens with the Plants. This rises with an upright woody Stem 10 or 12 Feet high, dividing upward into many Branches, covered with a smooth grayish Bark, and are garnished with trifoliate Leaves standing on long Foot Stalks. The Lobes are oval, Spear-shaped, smooth, and of a bright green on their upper Side, but pale on their under; these come out late in the Spring, and at the same Time the Bunches of Flower Buds appear, which is generally in the Beginning of June, the Leaves being then but small, and afterward increase in their Size, but are not fully grown till the Flowers decay. The Flowers are produced in large Bunches at the End of the Branches, they are of an herbaceous white Colour, composed of 4 or 5 short Petals, ending in acute Points; these are fastened at their Base to a short Empalement, cut into 4 Segments almost to the Bottom. In the Center is situated an orbicular compressed Germen supporting a short Style, which is attended by 4 Awl-shaped Stamina; the Germen turns to a Capsule surrounded by a leafy Border, having 2 Cells, each containing one Seed.

These Shrubs may be propagated by Cuttings, which should be planted in Pots of fresh rich Earth, and plunged

into a moderate hot Bed. The best Time for planting them is in the Beginning of March, but they must be carefully managed; so as not to have too much Heat, and shaded from the Sun in the Middle of the Day, otherwise they will not succeed. They may also be propagated by Layers, but these are often two Years before they take Root; but if good Seeds can be procured either here or from Abroad, the Plants raised from those will be much stronger, than those which are propagated by either of the former Methods.

These Seeds may be sown in the Beginning of April, on a Bed of light Earth, in a warm sheltered Situation, where, if the Ground is moistened in dry Weather, the Plants will come up in six Weeks; but if the Seeds are sown in Pots, and placed on a very moderate hot Bed, the Plants will come up sooner, and make greater Progress the first Year; but they must not be forced or drawn, for that will make them very tender; therefore in June the Plants should be exposed to the open Air, in a sheltered Situation, where they may remain till the Frost comes on; when those in the Pots should be either placed under a common Frame, to shelter them from severe Frost; or the Pots plunged into the Ground, near a Hedge, that the Frost may be prevented from penetrating through the Sides of the Pots to the Roots of the Plants. The following Spring the Plants may be planted into a Nursery Bed, at about one Foot Distance, where they may grow two Years, by which Time they will be fit to transplant where they are to remain.

These Plants are a little tender while they are young, therefore will require some Protection the 1st and 2d Year, particularly from the early Frosts in Autumn, which frequently kill the Tops of the tender Shoots before they are hardened; and the more vigorous the Plants have grown the preceding Summer, the greater Danger there is of their being killed, therefore they should be screened either with Mats or some other Covering; but as they advance in Strength, they become more hardy, and are rarely injured by Frost.

The 2d Sort grows naturally in both Indies; it is very common in most of the Islands in the West-Indies. This sends up several Stalks from the Root, about the Size of a Man's Arm, sending out several upright Branches, covered with a light brown Bark, which frequently separates from the Wood, and hangs loose; they are garnished with stiff Leaves, which vary greatly in their Shape and Size, some being 4 Inches long, and an Inch and a Half broad; others are not 3 Inches long, and a Quarter of an Inch broad; they are Spear-shaped, entire, and of a light green, growing with their Points upward, and have very short Foot Stalks. The Flowers are produced at the End of the Branches in a Sort of Racemus, each standing upon a slender Foot Stalk about an Inch long; they have 4 solid channelled Petals of an herbaceous Colour, having 4 Stamina which spread open, and in the Center is situated a roundish compressed Germen, which turns to a compressed Capsule with 3 Cells, surrounded by a broad leafy Border, each Cell containing one or two roundish Seeds.

This Plant is Propagated by Seeds, which, if obtained fresh from Abroad, will rise easily upon a hot Bed; when the Plants are fit to remove, they should be

be each planted in a small Pot filled with light loamy Earth, and plunged into a hot Bed of Tanners Bark, shading them from the Sun till they have taken new Root; then they should have free Air admitted to them every Day, in Proportion to the Warmth of the Season; for they must not be drawn up weak, nor should they have too much Water. In Autumn, the Plants must be removed into the Stove, where they should have a temperate Warmth in Winter; during that Season but little Water should be given them, nor should they have too much Heat, for either of these will soon destroy them: As the Plants obtain Strength, they will become more hardy, and may be set in the open Air for 2 or 3 Months in the Heat of Summer, in a sheltered Situation; in the Winter they must be placed in a Stove, kept to a moderate Temperature of Warmth, for the Plants will not live in a Green-house here.

This was formerly shewn for the Tea Tree in many of the European Gardens, where it many Years passed for it among those who knew no better.

PULEGIUM. *Raii. Meib. Plant. 61. Mentha. Tourn. Inst. R. H. 189. Lin. Gen. Plant. 633.* [So called from *Pulex*, a Flea; because being burnt, it is said to drive away Fleas.] Pennyroyal, or Pudden-grass.

The Characters are,

The Empalement of the Flower is permanent, of one Leaf, cut into 5 Parts. The Flower is of the Lip Kind it hath one Petal with a short Tube, divided at the Brim into 4 Parts; the Helmet or upper Lip of the Flower is entire, the lower is cut into 3 equal Segments. It hath 4 Stamina, 2 being longer than the other, terminated by roundish Summits, and a four-pointed Germen supporting an erect Style, crowned by a bifid Stigma. The Germen becomes four small Seeds, sitting in the Empalement of the Flower.

The Species are,

1. **PULEGIUM foliis ovatis obtusis, flaminibus corollam aequantibus, caule repente.** Penny-royal with oval obtuse Leaves, Stamina equalling the Petal, and a creeping Stalk. This is the *Pulegium latifolium*. C. B. P. Common, or broad-leaved Pennyroyal.

2. **PULEGIUM foliis lanceolatis, flaminibus corollâ longioribus, caule erecto.** Pennyroyal with Spear-shaped Leaves, Stamina longer than the Petal, and an upright Stalk. This is the *Pulegium Hispanicum erectum, flaminibus solum exstantibus*. Acl. Pöhl. Lond. Upright Spanish Pennyroyal, whose Stamina stand out from the Flowers.

3. **PULEGIUM foliis linearibus, floribus verticillatis terminalibusque.** Penny-royal with linear Leaves, and Flowers growing in Whorls at the Ends of the Stalks. This is the *Pulegium angustifolium*. C. B. P. Narrow-leaved Pennyroyal.

The 1st Sort grows naturally upon moist Commons, where the Water stands in Winter, in many Parts of England. The Root is fibrous and perennial; the Stalks are smooth and trail on the Ground, putting out Roots at every Joint, whereby it spreads and propagates very fast; the Stalks are garnished at each Joint, by 2 oval Leaves, which are for the most part entire. The Flowers grow toward the upper Part of the Branches, coming out just above the Leaves at each Joint, in Whorls; they are of a pale purple Colour, small and

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galeated, the Helmet being entire; whereas in the Mint, this is indented at the Point. The Stamina of the Flowers are of the same Length with the Petal, but the Style is somewhat longer; the whole Plant has a very strong Smell, and a hot aromattick Taste. There is a distilled Water of this Plant and also an Oil, which is kept in the Shops for medicinal Use. There is a Variety of this with a white Flower, which is sometimes found growing naturally in England.

The Seeds of the 2d Sort were sent me from *Gibraltar*, which succeeded in the *Chelsea* Garden, but had been before introduced into several Gardens, where it had been cultivated to supply the Markets. The Stalks of this grow erect and near a Foot high; the Leaves are longer and narrower than those of the common Sort, the Whorls of Flowers are much larger, and their Stamina are longer than the Petals. This Sort hath almost superseded the first in the Markets, for as the Stalks grow erect, so it is much easier to cut and tie in Bunches than the common Sort; it also comes earlier to flower, and has a brighter Appearance, but whether it is as good for Use, I shall leave to be determined by those whose Province it belongs to.

The 3d Sort grows naturally in the South of France and Italy, it is called *Hart's Pennyroyal*. This is by some preferred to the common Sort for medicinal Use; the Stalks of this grow erect, near 2 Feet high, sending out Side Branches all their Length; the Leaves are very narrow, and of a thicker Substance than those of the common Sort, the Whorls of Flowers are rather larger; the Scent is not quite so strong as that of the first Sort, and the Stalks are frequently terminated by Whorls of Flowers. This is cultivated in Gardens here, and flowers about the same Time as the common Sort. There is a Variety of this with white Flowers, which grows taller than that with purple Flowers, but I do not believe it is a different Sort.

All these Plants propagate themselves very fast by their Branches trailing upon the Ground, which emit Roots at every Joint, and fasten themselves into the Earth, and send forth new Branches; so that no more is required in their Culture, than to cut off any of these rooted Branches, and plant them out in fresh Beds, allowing them at least a Foot from Plant to Plant every Way, that they may have Room to grow; or the young Shoots of these planted in the Spring, will take Root like Mint.

The best Time for this Work is in September, that the Plants may be rooted before Winter; for if the old Roots are permitted to remain so close together, as they generally grow in the Compass of a Year, they are subject to rot in Winter; besides, the young Plants will be much stronger, and produce a larger Crop the succeeding Summer, than if they were removed in the Spring. These Plants all love a moist strong Soil, in which they will flourish exceedingly.

PULMONARIA. *Tourn. Inst. R. H. 136. Tab. 55. Lin. Gen. Plant. 169.* [So called from *Pulmoner*, Lat. the Lungs, because supposed to be a very good Medicament for the Lungs.] Lungwort; in French, *Pulmonaire*.

The Characters are,

The Flower hath a cylindrical, five cornered, permanent, Empalement of one Leaf, cut into five Parts at the Top.

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The Flower is of one Petal, having a cylindrical Tube the Length of the Empalement, cut at the Top into five Parts, which spread open, but the Chaps are pervious. It hath 5 short Stamina, terminated by erect Summits which close together, and 4 Germina supporting a short Style, crowned by an obtuse indented Stigma. The Germina turn to 4 roundish Seeds, sitting in the Bottom of the Empalement.

The Species are,

1. *PULMONARIA foliis radicalibus ovato-cordatis scabris. Hort. Cliff. 44.* Lungwort whose lower Leaves are oval, Heart-shaped, and rough. This is the *Pulmonaria vulgaris, maculoso folio. Clus. Hist. clxix.* Common spotted Lungwort, or Jerusalem Cowslip.

2. *PULMONARIA foliis caulinis ovatis glabris, floribus patulis, segmentis obtusiusculis.* Lungwort with oval smooth Leaves to the Stalks, spreading Flowers, and obtuse Segments. This is the *Pulmonaria Alpina, foliis mollioribus subrotundis, flore caeruleo. Tourn.* Lungwort of the Alps, with soft roundish Leaves, and a blue Flower.

3. *PULMONARIA foliis lanceolatis basi semiamplexicaulis, calycibus abbreviatis.* Lungwort with Spear-shaped Leaves, whose Base half embraces the Stalk, and the Empalement shorter than the Tube of the Flower. This is the *Pulmonaria maxima foliis quasi saccharo incrustatis. Pluk. Alm. 359.* Greatest Lungwort with spotted Leaves, as if they were incruited with Sugar.

4. *PULMONARIA foliis radicalibus lanceolatis. Hort. Cliff. 44.* Lungwort with the lower Leaves Spear-shaped. This is the *Pulmonaria angustifolia caeruleo flore. J. B.* Narrow-leaved Lungwort with a blue Flower.

5. *PULMONARIA caulibus procumbentibus, floribus singularibus alaribus, calycibus inflatis corollâ longioribus.* Lungwort with trailing Stalks, Flowers growing singly from the Sides, and swollen Empalements which are longer than the Petal. This is the *Pulmonaria Orientalis, calyce vesicario, foliis ecchii, flore purpureo infundibuliformi. Tourn. Cor. 6.* Eastern Lungwort with an Empalement like a Bladder, a Viper's Bugloss Leaf, and a purple Funnel-shaped Flower.

6. *PULMONARIA calycibus abbreviatis, foliis lanceolatis obtusiusculis. Lin. Sp. Plant. 135.* Lungwort with short Empalements to the Flowers, and Spear-shaped obtuse Leaves. This is the *Symphytum sive pulmonaria non maculata, foliis glabris acuminatis flore patulo caeruleo. Pluk. Alm. 359.* Lungwort with smooth, unspotted, acute-pointed Leaves, and a blue spreading Flower.

The 1st Sort grows naturally in Woods and shady Places, in Italy and Germany, and is cultivated in the English Gardens chiefly for medicinal Use. It hath a perennial fibrous Root; the lower Leaves are rough, of an oval-Heart Shape, about 6 Inches long, and 2 Inches and a Half broad, of a dark green on their upper Side, marked with many broad whitish Spots, but pale and unspotted on their under Side; the Stalks rise almost a Foot high, having several smaller Leaves on them, standing alternately. The Flowers are produced in small Bunches on the Top of the Stalks, each having a tubulous hairy Empalement, as long as the Tube of the Flower; the Brims of the Petal are spread open above them, which are shaped like a Cup; these are red, purple, and blue, in the same Bunch. They appear in April, and are succeeded by four naked Seeds, which ripen in the Empalement. It is accounted a pec-

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toral balsamick Plant, and good for Coughs and Consumptions, spitting of Blood, and the like Disorders of the Lungs; it is likewise put into Wound Drinks.

The 2d Sort grows naturally on the Alps; this hath a perennial fibrous Root, the Leaves are large, smooth, and spotted on their upper Side; the Stalks rise 9 Inches high, and are garnished with oval Leaves whose Bases join the Stalks. The Flowers grow in small Bunches on the Top of the Stalk, they are purple, and spread open wider than those of the common Sort.

The 3d Sort grows naturally upon the Helvetic Mountains; this is a perennial Plant, whose Leaves are large, Spear-shaped, and rough. The Foot Stalks of the lower Leaves are broad; the Stalks rise a Foot high, and are garnished with Spear-shaped Leaves, whose Bases half embrace the Stalks; the Leaves are greatly spotted with white, appearing as if they were incruited with Sugar Candy; the Flowers grow in large Bunches on the Top of the Stalk; their Tubes are longer than the Empalement, and their Brims are spread more than those of the common Sort. They are of a bright blue, and appear in April and May.

The 4th Sort grows naturally in Austria and Hungary; this hath Leaves much narrower than those of the common Sort, which are covered with soft Hairs. The Stalks rise a Foot high, and are garnished with narrow Leaves of the same Shape with those below, but smaller; these almost embrace the Stalk with their Base. The Flowers are produced in Bunches on the Top of the Stalks; these appear of a red Colour before the expand, but, when they are fully blown, are of a most beautiful blue. This Sort flowers early in Spring, but is very rare in England at present.

The 5th Sort was discovered in the Archipelago by D. Tournefort, who sent the Seeds to the Royal Garden at Paris; this is an annual Plant. The lower Leaves are oblong and hairy; the Stalks trail upon the Ground, and are a Foot and a Half long, garnished with oblong hairy Leaves sitting close to the Stalks; just above each Leaf comes a single Flower of a full purple Colour, Funnel-shaped, the Brims not spreading; the Empalement is swollen like an inflated Bladder, and covers the Petal of the Flower, so as not to be seen without a near Inspection. This Plant flowers in May, if the Plants come up in Autumn, and after the Flowers are past, the four Seeds ripen in the Empalement.

The 6th Sort grows naturally on Mountains in North America. The Seeds were sent many Years since by Mr. Banister from Virginia, and some of the Plants were raised in the Gardens of the Bishop of London at Fulham, where for several Years it was growing, and was communicated to several other curious Gardens; this hath a thick, fleshy, perennial Root sending out many small Fibres. The Stalks rise a Foot and Half high, and divide at the Top into several short Branches; the Leaves, which are near the Root, are 4 or 5 Inches long, and 2 and a Half broad; they are smooth, obtuse, and of a light green, having short Foot Stalks; those upon the Stalk diminish in their Size upward, but are of the same Shape, and sit close to the Stalk. Each of the small Branches at the Top of the Stalk is terminated by a Cluster of Flowers, each standing upon a separate short Foot Stalks; their Empalements are very

very short, and are cut into 5 Segments almost to the Bottom; the Tube of the Flower is long, and at the Top spreads open in Shape of a Funnel, the Brim being entire, but appears five-cornered from the Folding of the Petal. The most common Colour of these Flowers is blue, but there are some purple, others red, and some white. They appear in April, and, if they have a shady Situation, will continue in Beauty great Part of May, and sometimes they are succeeded by Seeds in England. The Leaves and Stalks entirely decay in August, and the Roots remain naked till the following Spring.

Some other Species of this Genus are preserved in Botanick Gardens for Variety, but, having little Beauty, they are seldom cultivated in other Places.

The 1st, 2d, 3d, 5th; and 6th Sorts have perennial Roots, so may be cultivated by parting their Roots, which may be done either in Spring, or Autumn; but if the Ground be moist, into which they are planted, it is better to be done in Spring, otherwise Autumn is the most preferable Season, that the Plants may be well rooted before the dry Weather comes on in Spring, which will cause them to flower much stronger.

The Soil in which they are planted should not be rich, but rather a fresh light sandy Ground, in which they will thrive much better than in a richer Soil, where they are very subject to rot in the Winter. They should have a shady Situation, and the 1st and 3d Sorts thrive best in a moist Soil, for in a hot dry Soil they burn and decay in Summer, unless they are duly watered in dry Weather. All these early Sorts are better transplanted, and parted in Autumn, that they may be well rooted to flower strong the following Spring. The 6th Sort should not have a Soil too moist, for as the Roots run deep in the Ground, they will be in Danger of rotting by much Wet.

The other Sort is annual, and propagated by Seeds only. The best Time to sow these is in Autumn, soon after they are ripe, for the Plants will resist the Cold of our Winters very well, so will flower early the following Summer, and good Seeds may be obtained; whereas those which are sown in the Spring sometimes miscarry, or lie a Year in the Ground. These Seeds should be sown where they are designed to remain, for the Plants do not succeed very well, when they are transplanted. When the Plants come up, they require no other Culture, but to keep them clear from Weeds, and, where they are too close, to thin them. If these Plants are permitted to scatter their Seeds, the Plants will come up better than when they are sown.

PULSATILLA. Tourn. Inst. 284. *Anemone*. Lin. Gen. Pl. 614. [so called of *Pulsando*, Lat. because the Seeds of this Plant are blown away with the least Wind.] Pasque-flower; in French, *Coquelourde*.

The Characters are,

The Flower hath a leafy Involucrum ending in many Points; it hath two Orders of Petals, three in each which are oblong and pointed, and a great Number of slender Stamina, about half the Length of the Petals, terminated by erect Twin Summits, and a great Number of Germina collected in a Head, with acute Styles crowned by obtuse Stigmas. The Germina afterward become so many Seeds, having long hairy Tails sitting upon the oblong Receptacle.

The Species are,

1. *PULSATILLA foliis decompositis pinnatis, flore nuntante, limbo erecto*. Hort. Cliff. 223. Pasque-flower with decomposed winged Leaves, and a nodding Flower having an erect Rim. This is the *Pulsatilla folio crassiflora & majore flore*. C. B. P. 177. Pasque-flower with a thicker Leaf, and a larger Flower.

2. *PULSATILLA foliis decompositis pinnatis, flore pendulo, limbo reflexo*. Hort. Cliff. 223. Pasque-flower with decomposed winged Leaves, and a pendulous Flower whose Border is reflexed. This is the *Pulsatilla flore minore nigricante*. C. B. P. 177. Pasque-flower with a smaller darkish Flower.

3. *PULSATILLA foliis simpliciter pinnatis, foliis lobatis, flore erecto*. Flor. Suec. 448. Pasque-flower with simple winged Leaves, whose Wings have Lobes and an erect Flower. This is the *Pulsatilla lutea apii bortenensis folio*. C. B. P. 177. Yellow Pasque-flower with a Smallage Leaf.

4. *PULSATILLA foliis digitatis multifidis, flore erecto patente*. Pasque-flower with Hand-shaped Leaves having many Points, and an erect spreading Flower. This is the *Pulsatilla anemones folio dissecto lanuginosa, flore majore dilute luteo patente*. Amman. Ruth. 104. Pasque-flower with a cut Anemone Leaf which is downy, and a larger pale-yellow spreading Flower.

The 1st of these Plants is common in divers Parts of England; it grows in great Plenty on Gogmagog Hills on the Left-hand of the Highway leading from Cambridge to Haveril, just on the Top of the Hill; also about Hilderham, six Miles from Cambridge, and on Bernack Heath not far from Stamford, and on Southrop Common adjoining thereto; also on mountainous and dry Pastures just by Leadstone Hall near Pontefract in Yorkshire. It flowers in April.

This hath a fleshy taper Root which runs deep in the Ground; the Leaves are hairy, and finely cut, like those of the wild Carrot, and spread near the Ground; the Stalk rises near a Foot high, is pretty thick and hairy, and naked to the Top, where there is a leafy Involucrum to the Flower, which is hairy, ending in many Points; it is terminated by one Flower composed of six Petals ranged in two Orders, three without, and three within; they are oblong, thick, and of a bright purple Colour; they form a Sort of Bell-shaped Flower nodding on one Side, and their Points turn upward. Within the Petals are a great Number of slender yellowish Stamina terminated by erect Summits, and in the Center a great Number of Germina are collected in a Head, which afterward become Seeds, each having a long Tail, by which they are distinguished from Anemone.

There is a Variety of this with double Flowers, and another with white, but these have been obtained from Seeds of the other.

The 2d Sort hath shorter Leaves than the first; the Stalks do not rise so high; the Flowers do not expand so wide, and hang downward, but their Brims are reflexed; they are of a very dark purple Colour. This grows naturally in the Meadows in Germany.

The 3d Sort grows naturally on the Alps and Helvetic Mountains; this hath a perennial Root. The Leaves are like those of Smallage, and are simply

winged; the Stalk rises near a Foot high, is naked almost to the Top, where comes out a neat hairy Involucrum, and above that one yellow Flower shaped like the perennial yellow Adonis standing erect. These appear about the same Time with the former, and are succeeded by Seeds which ripen at *Midsummer*.

The 4th Sort grows in *Siberia*; this hath a thick fleshy Root which sends out many strong Fibres. The Leaves are Hand-shaped, composed of several roundish Lobes, like some of the Sorts of *Ranunculi*; they are downy, and cut into several Segments. The Stalk rises 9 or 10 Inches high, having a hairy Involucrum a considerable Distance below the Flower; it is terminated by one Flower, which is large, spreading, and of a whirish yellow Colour, with deep yellow Stamina. This flowers early in the Spring.

There are some other Species of this Plant, but those here mentioned are all the Sorts which I have seen growing in *England*, and therefore I have not enumerated more, as it would be to little Purpose, since it is difficult to procure them from the Countries where they naturally grow.

These Plants may be propagated by Seeds, which should be sown in Boxes or Pots filled with very light sandy Earth, observing not to cover the Seeds too deep with Mould, which will prevent their rising, for they require no more than just to be covered. These Boxes should be placed where they may have the Morning Sun until ten of the Clock, but must be screened from it in the Heat of the Day, and, if the Season proves dry, the Earth should be often refreshed with Water. The best Time for sowing these Seeds is in *July*, soon after they are ripe, for if they are kept till Spring, they seldom grow.

These Boxes or Pots, in which the Seeds are sown, should remain in this shady Situation until the Beginning of *October*, when they should be moved where they may enjoy the full Sun during the Winter Season. About the Beginning of *March* the Plants will begin to appear, at which Time the Boxes should be again removed where they may have only the Forenoon Sun; for if they are too much exposed to the Heat, the young Plants will die away. They should also be refreshed with Water in dry Weather, which will greatly promote their Growth, and they must be carefully kept clean from Weeds, which, if suffered to grow among them, will in a short Time destroy them.

When the Leaves of this Plant are entirely decayed (which is commonly in *July*), you should then take up all the Roots, which, being nearly of the Colour of the Ground, will be difficult to find while small; therefore you should pass the Earth through a fine Wire Sieve, which is the best Method to separate the Roots from the Earth (but notwithstanding all possible Care taken, yet there will be many small Roots left; so that the Earth should either be put into the Boxes again, or spread upon a Bed of light Earth, to see what Plants will arise out of it the succeeding Year.) The Roots, being taken up, should be immediately planted again on Beds of light fresh sandy Earth about 3 or 4 Inches asunder, covering them about three Inches thick with the same light Earth. The Spring following most of these Plants will produce Flowers, but they will not

be so large and fair as in the succeeding Years, when the Roots are larger.

The Roots of these Plants generally run down deep in the Ground, and are of a fleshy Substance, somewhat like Carrots, so will not bear to be kept long out of the Ground; therefore, when they are removed, it should be done in Autumn, that they may take fresh Root before the Frost comes on; for if they are transplanted in the Spring, they will not produce strong Flowers. These Plants thrive best in a loamy Soil, for in very light dry Ground they are apt to decay in Summer.

PUMPKION. See *Pepo*.

PUNICA. *Tourn. Infl. R. H. 633. Tab. 407. Lin. Gen. Plant. 544.* [This Plant takes its Name from its punicean or red Appearance, for its Flowers and Fruit are of that Colour. It is called *Granatum*, from the Word *Granis*, because the Fruit has many Grains; or, as some suppose, of *Granata*, or *Granada*, because it grows in great Plenty in that Country.] The Pomegranate Tree; in *French*, *Grenadier*.

The Characters are,

The Empalement of the Flower is permanent, Bell-shaped, coloured, and of one Leaf cut into six Parts at the Top. The Flower has 5 roundish, erect, spreading Petals inserted in the Empalement, and a great Number of slender Stamina, also inserted in the Empalement, terminated by oblong Summits. The Germen is situated under the Flower, supporting a single Style crowned by a beaded Stigma; it becomes a large almost globular Fruit crowned by the Empalement. The Fruit is divided into several Cells by membranous Partitions filled with roundish succulent Seeds.

The Species are,

1. *PUNICA foliis linearilanceolatis, caule arborecente, flore majore.* Pomegranate with linear Spear-shaped Leaves, a Tree-like Stalk, and a larger Flower. This is the *Punica quæ malum granatum fert. Cæsalp. Punica* which bears the Pomegranate.

2. *PUNICA foliis linearibus, caule frutescente, flore minore.* Pomegranate with linear Leaves, a shrubby Stalk, and a smaller Flower. This is the *Punica Americana, nana seu humillima. Lig. Tourn. Infl. 636.* The American Dwarf Pomegranate.

There are the following Varieties of the 1st Sort, which are supposed to be accidental Variations obtained by Culture from the Seeds, therefore I have not enumerated them as Species, but as many curious Persons will expect to find to them inserted here, I shall just mention them.

The wild Pomegranate with single and double Flowers, The sweet Pomegranate.

The small flowering Pomegranate with single and double Flowers.

The Pomegranate with striped Flowers.

These Plants grow naturally in *Spain, Portugal, Italy, and Mauritania*. There are also many of them in the *West-Indies*, but they are supposed to have been transplanted there from *Europe*. They are so much improved there, as to be much preferable to any in *Europe*, the Fruit being larger and finer flavoured.

This Tree-rises with a woody Stem 18 or 20 Feet high, sending out Branches the whole Length, which likewise put out many slender Twigs, so as to render them very thick and bushy. Some of these are armed

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armed with sharp Thorns; they are garnished with narrow Spear-shaped Leaves about 3 Inches long, and half an Inch broad in the Middle, drawing to a Point at each End; they are of a light lucid green, and stand opposite. The Flowers come out at the End of the Branches sometimes singly, and at others 3 or 4 together; one of the largest terminates the Branch, and immediately under that are 2 or 3 smaller Buds, which, after the Flower is past, swell larger, and expand, whereby there is a continued Succession of Flowers for some Months. The Empalement of the Flower is very thick, fleshy, and of one Piece cut at the Top into 5 Segments, it is of a fine red Colour, and within are included 5 (in the single Flowers, but in the double a great Number) of scarlet Petals, which are inserted in the Empalement. In the Center is situated the Style, arising from the Germen, encompassed by many slender Stamina, which are terminated by oblong yellowish Summits. After the Flower decays, the Germen swells to a roundish Fruit crowned by the Empalement, having a hard Shell including a Pulp filled with angular Seeds. This Tree flowers in *July, August, and September*, and the Fruit ripens late in Autumn.

The *Balaustia* of the Shops is the Empalement of the Flower of the double flowering Pomegranate,

The 1st of these Trees is now common in the *English* Gardens, where formerly it was nursed up in Cases, and preserved in Green-houses with great Care (as was also the double flowering Kind;) but they are both hardy enough to resist the severest Cold of our Climate in the open Air, and, if planted against warm Walls in a good Situation, the first Sort will often produce Fruit, which in warm Seasons will ripen tolerably well; but as these Fruits do not ripen till late in Autumn, they are seldom well tasted in *England*, for which Reason the Sort with double Flowers is commonly preferred. The Sort with sweet Fruit also the wild Sort, are less common in the *English* Gardens than the former two.

These Plants may be easily propagated by laying down their Branches in the Spring, which in one Year's Time will take good Root, and may then be transplanted where they are designed to remain. The best Season for transplanting these Trees is in Spring, just before they begin to shoot; they should have a strong rich Soil, in which they flower much better, and produce more Fruit, than if planted on dry poor Ground, but in order to obtain these in Plenty, there should be Care taken in the Pruning of these Trees, for Want of which, we often see them very full of small Shoots, but do not find many Flowers produced upon them; therefore I shall set down Directions for pruning these Trees, so as to obtain a great Quantity of Flowers and Fruit.

The Flowers of this Tree always proceed from the Extremity of the Branches which are produced the same Year. This therefore directs, that all weak Branches of the former Year should be cut out, and that the stronger should be shortened in Proportion to their Strength, in order to obtain new Shoots in every Part of the Tree. The Branches may be laid in against the Wall about 4 or 5 Inches asunder; for, as their Leaves are small, there is not a Necessity of allowing them a greater Distance. The best Time for this

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Work is about *Michaelmas*, or a little later, according to the Mildness of the Season, for if they are left until Spring before they are pruned, they seldom put out their Shoots so early, and the earlier they come out, the sooner the Flowers will appear, which is of great Consequence where Fruit is desired. In Summer they will require no other Dressing, but to cut off very vigorous Shoots which grow from the Wall, and never produce Flowers (for it is the middling Shoots only which are fruitful; and when the Fruit is formed, the Branches on which they grow should be fastened to the Wall, otherwise the Weight of the Fruit, when grown large, will be apt to break them down.

Though the Fruit of this Tree seldom arrives to any Perfection in this Country, so as to render it valuable; yet, for the Beauty of its scarlet coloured Flowers, together with the Variety of its Fruit, there should be one Tree planted in every good Garden, since the Culture is not great which they require; the chief Care is to plant them on a rich, strong Soil, and in a warm Situation. Upon some Trees which had these Advantages, I have obtained a great Quantity of Fruit which arrived to their full Magnitude, but I cannot say they were well-flavoured; however, they made a very handsome Appearance upon the Trees.

The double flowering Kind is the most in esteem in this Country for the Sake of its large, fine, double Flowers which are of a most beautiful scarlet Colour; and, if the Trees are supplied with Nourishment, will continue to produce Flowers for near 3 Months successively, which renders it one of the most valuable flowering Trees yet known. This must be pruned and managed as hath been already directed for the Fruit-bearing Kind, but this Sort may be rendered more productive of its beautiful Flowers by grafting it upon Stocks of the single Kind, which will check the Luxuriancy of the Trees, and cause them to produce Flowers upon almost every Shoot; by which Method I have had a low Tree, which was planted in the open Air, extremely full of Flowers, which made a very fine Appearance.

The 2d Sort grows naturally in the *West-Indies*, where the Inhabitants plant it in their Gardens to form Hedges. It seldom rises more than 5 or 6 Feet in those Countries, so may be kept within Compass, and there the Plants continue flowering great Part of the Year. The Flowers are much smaller than those of the common Sort; the Leaves are shorter and narrower, and the Fruit is not larger than a Nutmeg, and has little Flavour, so it is chiefly propagated for the Beauty of its Flowers. This is undoubtedly a distinct Species from the common Sort, and is much tenderer.

This Plant may be propagated by Layers as the former Sorts, but must be planted in Pots filled with rich Earth, and preserved in a Green-house, otherwise it is too tender to endure the Cold of our Winters; and in the Summer, when the Flowers begin to appear, if the Plants are exposed to the open Air, the Buds will fall off, and never open, so that they should not be exposed to the open Air, but placed in an airy Glass Case giving them a large Share of Air every Day in mild Weather. As they will be covered at the Top by the Glasses, the Flowers will expand, and the Fruit will grow to the full Size in *England* with this Management, though

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though they are not very desirous; but hereby the Plants may be continued in flower upward of 3 Months, and will make a fine Appearance.

PURSLAIN. See Portulaca.

PYRACANTHA. See Mespilus.

PYROLA. Tourn. Inst. R. H. 256 Tab. 132. Lin. Gen. Plant. 490. Winter-green.

The Characters are,

The Flower hath a small permanent Empalement cut into 5 Parts; it hath 5 roundish, concave, spreading Petals, and 10 Awl-shaped Stamina terminated by large nodding Summits with 2 rising Horns, and a roundish Germen supporting a slender Style, which is permanent and longer than the Stamina, crowned by a thick Stigma. The Germen afterward becomes a roundish, depressed, five-cornered Capsule, with 5 Cells opening at the Angles, filled with Seeds.

The Species are,

1. PYROLA flaminibus ascendentibus, pistillo declinato. Flor. Suec. 330. Winter-green with rising Stamina and a declining Pointal. This is the *Pyrola rotundifolia major*. C. B. P. Greater round-leaved Winter-green.

2. PYROLA racemo unilaterali. Flor. Suec. 332. Winter-green with a Bunch of Flowers on one Side the Foot Stalk. This is the *Pyrola folio mucronato serrato*. C. B. P. Winter-green with a sawed pointed Leaf.

3. PYROLA scapo uniflora. Flor. Lapp. 167. Winter-green with one Flower in a Sheath. This is the *Pyrola rotundifolia minor*. C. B. P. 191. Smaller round-leaved Winter-green.

4. PYROLA pedunculis bifloris Lin. Sp. Plant. 396. Winter-green with two Flowers on a Foot Stalk. This is the *Pyrola Marylandica minor*, folio mucronato arbuti. Pet. Mus. 675. Smaller Winter-green of Maryland with a pointed Strawberry Leaf.

The 1st Sort grows wild in many Places in the North of England, particularly near *Hallifax* in *Yorkshire*, on rocky Hills, and Heaths, as also in shady Woods; so it is very difficult to preserve in Gardens in the southern Parts.

This hath a perennial Root, from which spring out five or six roundish Leaves about an Inch and a Half long, and almost as Broad, of a thick Consistence, of a deep lucid green, and entire, standing upon pretty long Foot Stalks. Between these arises a slender upright Stalk near a Foot high, naked great Part of the Length, ending in a loose Spike of Flowers, which are composed of five large concave white Petals spreading open like a Rose, but the two upper Leaves are formed into a Kind of Helmet. In the Center is situated a crooked Pointal, bending downward, attended by ten slender Stamina terminated by Saffron-coloured Summits. It flowers in July, and the Flowers are succeeded by cornered compressed Capsules, having five Cells, filled with small Seeds.

The 2d Sort grows naturally upon Mountains in Italy, near *Verona* and *Genoa*, and I have found it growing in *Westmoreland*. This hath a slender creeping perennial Root, from which arise 2 or 3 very slender ligneous Stalks about 5 Inches high, sustaining at the Top 4 or 5 oval acute-pointed Leaves an Inch and a Half long, and one broad, of a thinner Consistence, and a brighter green than those of the former, each standing upon a short Foot Stalk; and between these, on the Side of the

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Stalk, comes out the Foot Stalk of the Flowers, upon which they are ranged along one Side; they are shaped like the other, but are smaller, as are also the Capsules. It flowers in July.

The 3d Sort grows naturally in shady Woods in the northern Parts of Europe. This hath a perennial creeping Root, from which come forth four or five roundish Leaves of a pretty thick Consistence, and between these arises a Foot Stalk about four Inches high, sustaining one large white Flower on the Top, of the same Shape as the others. It flowers in June.

The 4th Sort grows naturally in North America; this hath a ligneous perennial Root, from which arise 2 or 3 ligneous Stalks, a Foot and a Half high, garnished with stiff Leaves, 2 or 3 Inches long, and one broad near the Base, ending in acute Points, and have some sharp Indentures on their Borders; the Mid-rib is remarkably broad, and very white, as are also the Veins which run from it. The Flowers are produced at the End of the Stalk on slender Foot Stalks about 3 Inches long, each sustaining two small pale-coloured Flowers at the Top. It flowers in June.

These are all of them very difficult to cultivate in Gardens, for as they grow on very cold Hills, and in mossy moorish Soil, when they are removed to a better Soil, and in a warmer Situation, they seldom continue long. The best Time to transplant these Plants into Gardens is about *Michaelmas*, provided the Roots can then be found, when they should be taken up with Balls of Earth to their Roots, and planted in a shady Situation, and on a moist undunged Soil, where they should be frequently watered in dry Weather, otherwise they will not thrive. Some of these Plants may be planted in Pots, which should be filled with Earth as nearly resembling that, in which they naturally grow, as possible, and place them in a shady Situation, where, if they are constantly watered in dry Weather, they will thrive very well.

The 1st Sort is ordered by the College of Physicians to be used in Medicine, and is generally brought over from Switzerland amongst other vulnerary Plants, amongst which Class this Plant is ranged, and by some hath been greatly commended.

PYRUS. Tourn. Inst. R. H. 628. Tab. 404. Lin. Gen. Plant. 550. The Pear Tree; in French, *Poirier*.

The Characters are,

The Flower hath a permanent Empalement of one Leaf, which is concave, and divided into 5 Parts at the Top; it hath 5 roundish concave Petals inserted in the Empalement, and about 20 Awl-shaped Stamina shorter than the Petals inserted in the Empalement, and terminated by single Summits. The Germen is situated under the Flower supporting 3 or 4 Styles crowned by single Stimas; it afterward becomes a pyramidal fleshy Fruit indented at the Top, but produced at the Base, having five membranaceous Cells, each containing one smooth oblong Seed pointed at the Base.

Dr. Linnæus has joined to this Genus the *Malus*, and *Cydonia* of Tournefort, making them of the same Genus.

The Pear and Quince may be joined together with more Propriety than the Apple with either, for the Fruit of the two former are produced at their Base, whereas the Apple is indented, nor will the Apple grow upon either of the other two, or they upon the Apple, when

when grafted or budded, but the Quince and Pear will grow upon each other, so there is a Boundary set by Nature between those and the Apple.

The several Varieties of Pears, which are now cultivated in the curious Fruit Gardens, have been accidentally obtained by Seeds, so must not be deemed distinct Species; but, as they are generally distinguished in the Fruit Gardens and Nursery by the Shape, Size, and Flavour of their Fruit, I shall continue those Distinctions, that the Work may not appear imperfect to such as delight in the Cultivation of these Fruits.

The Species are,

1. *PYRUS sativa, fructu æstivo parvo racemoso odoratissimo. Tourn. Petit Muscat. i. e.* Little Musk Pear, commonly called the Supreme. This Fruit is generally produced in large Clusters; it is rather round than long; the Stalk short; and, when ripe, the Skin is of a yellow Colour; the Juice is somewhat musky, and, if gathered before it is too ripe, is an excellent Pear. This ripens the Beginning of July, and will continue good but for a few Days.

2. *PYRUS sativa, fructu æstivo minimo odoratissimo. Tourn. Poire de Chio, i. e.* The Chio Pear, commonly called the little Bastard Musk Pear; this is smaller than the former, but is in Shape much like it; the Skin, when ripe, has a few Streaks of red on the Side next the Sun, and the Fruit seldom hangs in Clusters as the former, but in other Respects is nearly like it.

3. *PYRUS sativa, fructu æstivo parvo è viridi albido. Tourn. Poire Hâtiveau, i. e.* The Halting Pear: Poire Madeleine, ou Citron des Carmes, commonly called the green Chiffel. This is a larger Pear than either of the former, and is produced more toward the Pedicle. The Skin is thin, and of a whitish green Colour when ripe; the Flesh is melting, and, if not too ripe, of a sugary Flavour, but is apt to be meally. This ripens in the Middle of July.

4. *PYRUS sativa, fructu æstivo partim saturatè rubente, partim flavescente. Tourn. Muscadelles Rouges, i. e.* The red Muscadelle. It is also called La Bellissime, i. e. The fairest or Supreme. This is a large early Pear, of great Beauty; the Skin is of a fine yellow Colour, when ripe, beautifully striped with red; the Flesh is half melting, and has a rich Flavour, if gathered before it be too ripe, but it is apt to be meally. This generally produces two Crops of Fruit in a Year; the first is commonly ripe about the Middle of July, and the second ripens in September, but this late Crop is seldom well tasted.

5. *PYRUS sativa, fructu æstivo parvo flavescente moschato. Tourn. Petit Muscat, i. e.* The little Muscat. This is a small Pear rather round than long; the Skin is very thin, and, when ripe, of a yellowish Colour; the Flesh is melting and of a rich musky Flavour, but will not keep long when ripe. This comes the End of July.

6. *PYRUS sativa, fructu æstivo oblongo ferrugineo, carne tenerà moschatà Tourn. Cuisse Madame, Lady's Thigh, in England commonly called Jargonelle. This is a very long Pear, of a pyramidal Shape, having a long Foot Stalk; the Skin is pretty thick, of a russet green Colour from the Sun, but towards the Sun it is inclined to an Iron Colour; the Flesh is breaking, and has a rich musky Flavour: Ripe the Beginning of*

August. This is one of the best early Summer Pears yet known, and is certainly what all the French Gardeners call the Cuisse Madame, as may be easily observed by their Description of this Pear; but I suppose that the Titles of this and the Jargonelle were changed in coming to England, and have been continued by the same Names.

7. *PYRUS sativa, fructu oblongo, è viridi flavescente. The Windsor Pear.* This is an oblong Fruit, which swells toward the Crown, but near the Stalk is drawn toward the Point; the Skin is smooth, and, when ripe, of a yellowish green Colour; the Flesh is very soft, and, if permitted to hang but two or three Days after it is ripe, grows meally, and is good for nothing.

8. *PYRUS sativa, fructu æstivo oblongo, è viridi albo. The Jargonelle, now commonly called Cuisse Madame.* This is certainly what the French Gardeners call the Jargonelle, which, as I before observed, is now in England given to another Fruit much preferable to this, so that the two Names are changed; for the Jargonelle is always placed amongst those which the French call bad Fruit, and the Cuisse Madame is set down amongst their best Fruit, which is the Reverse with us, as they are now named. This Pear is somewhat like the Windsor, but is not so swelling toward the Crown, and is smaller toward the Stalk; the Skin is smooth, of a pale green Colour; the Flesh is apt to be meally, if it stands to be ripe, but being a plentiful Bearer, is much propagated for the London Markets.

9. *PYRUS sativa, fructu æstivo globoso sessili moschato maculis nigris consperso. Tourn. Orange Musquée, i. e.* the Orange Musk. This is a middle-sized Pear, of a short globular Form; the Skin is of a yellowish Colour spotted with black; the Flesh is musky, but is very apt to be a little dry and choaky. It ripens the Beginning of August.

10. *PYRUS sativa, fructu æstivo albido majori. Tourn. Gros Blanquet, i. e.* Great Blanket. This is also called La Muffette d'Anjou, i. e. The Bagpipe of Anjou. This is a large Pear approaching to a round Form; the Skin is smooth, and of a pale green Colour; the Flesh is soft, and full of Juice, which hath a rich Flavour; the Stalk is short, thick and spotted; the Wood is slender, and the Leaf is very much like that of the Tree called the Jargonelle. This ripens the Beginning of August.

11. *PYRUS sativa, fructu æstivo albido saccharato odoratissimo. Tourn. The Blanquette, or Musk Blanquette; the little Blanket Pear.* This Pear is much less than the former; and more pinched in near the Stalk, which is also short, but slenderer than that of the former; the Skin is soft and of a pale green Colour; the Flesh is tender, and full of a rich musky Juice; the Wood of this Tree is much stronger than is that of the former, and the Shoots are commonly shorter. This ripens the Middle of August.

12. *PYRUS sativa fructu æstivo albido, pediculo longo donato. Tourn. Blanquette à longue queue, i. e.* Long-stalked Blanket. This Pear is in Shape somewhat like the former, but the Eye is larger, and more hollowed at the Crown; toward the Stalk it is somewhat plumper, and a little crooked; the Skin is very smooth, white
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and sometimes toward the Sun is a little coloured; the Flesh is between melting and breaking, and is full of a rich sugary Juice. It ripens the Middle of August.

13. *PYRUS sativa, fructu æstivo oblongo rufescente saccharato. Tourn.* Poire sans Peau, *i. e.* The Skinless Pear. It is also called Fleur de Guigne, *i. e.* Flower of Guigne, and by some, Rouffelet hâtif, *i. e.* The early Rouffelet. This is a middle sized Fruit, of a long Shape and a reddish Colour, somewhat like the Russet; the Skin is extremely thin; the Flesh is melting, and full of a rich sugary Juice; the Shoots are long and strait. This ripens the Middle of August.

14. *PYRUS sativa, fructu æstivo turbinato, carne tenera saccharata. Muscat Robine, i. e.* The Musk Robine Pear. This is also called Poire à la Reine, *i. e.* The Queen's Pear; Poire d'Ambre, *i. e.* The Ambre Pear; and Pucelle de Xaintonge, *i. e.* The Virgin of Xaintonge. This is a small round Pear, of a yellowish Colour when ripe; the Flesh is between melting and breaking. It hath a rich musky Flavour, and is a great Bearer; it ripens the Middle of August.

15. *PYRUS sativa fructu æstivo turbinato moscato. Le Bourdon Mosque, i. e.* The Musk Drone Pear. This is a middle sized round Fruit, whose Skin is of a yellowish Colour when ripe; the Flesh is melting, and full of a high musky Juice, but it must not hang too long on the Tree, for it is subject to grow mealy in a short Time. This ripens the End of August.

16. *PYRUS sativa, fructu æstivo globoso sessili, & viridi purpurascente saccharato odorato. Tourn.* Orange Rouge, *i. e.* The red Orange Pear. This hath been the most common of all the Sorts in France, occasioned by the general Esteem it was in some Years since; it is a middle-sized round Fruit, of a greenish Colour, but the Side next the Sun changes to a purple Colour when ripe; the Flesh is melting, and the Juice sugared with a little Perfume; the Eye is very hollow, and the Stalk short. This ripens the End of August.

17. *PYRUS sativa, fructu æstivo oblongo minori cinereo odorato. Tourn.* Caffolette Friolet, Muscat Verd Leche-fion; so called from its being shaped like a perfuming Pot. It is a long Fruit, shaped like the Jargonelle, of an Ash Colour; its Flesh is melting, and full of a perfumed Juice, but it is very apt to rot in the Middle as soon as ripe, otherwise it would be esteemed an excellent Pear. It is ripe the End of August.

18. *PYRUS sativa, fructu æstivo turbinato & viridi albido. Orange Musquée, i. e.* The Musk Orange Pear. This is a large round Pear, in Shape like a Bergamot; the Skin is green, and the Flesh melting; it is very subject to rot upon the Tree, which renders it not so valuable as some others. It ripens the End of August.

19. *PYRUS sativa, fructu æstivo globoso & viridi purpurascente. Tourn.* Gros Oignonet, *i. e.* The Great Onion Pear. It is also called Amiré-roux, *i. e.* Brown Admired; and Roy d'Été, *i. e.* King of Summer; Archiduc d'Été, *i. e.* The Summer Archduke. This is a middle-sized round Pear, of a brownish Colour next the Sun; the Flesh is melting, and the Juice is passably good. This ripens the End of August.

20. *PYRUS sativa, fructu æstivo globoso sessili ex albido flavescente saccharato odorato. Tourn.* Robine. It is also called Muscat d'Aoust, *i. e.* The August Muscat;

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Poire d'Averat, *i. e.* The Averat Pear; and Poire Royale, *i. e.* The Royal Pear. This is a roundish flat Pear, in Shape very like a Bergamot; the Stalk is long, strait, and a little spotted, and the Eye is a little hollowed; the Skin is smooth, and of a whitish yellow Colour; the Flesh is breaking, but not hard; and its Juice is richly sugared and perfumed. It is a great Bearer, and is esteemed one of the best Summer Pears yet known; it ripens the End of August.

21. *PYRUS sativa, fructu æstivo globoso sessili odorato. Tourn.* Poire-rose, *i. e.* The Rose Pear; and L'Épine-rose, *i. e.* The Thorny Rose. This is a short round Fruit, shaped like the great Onion Pear but much larger; of a yellowish green Colour, but a little inclining to red on the Side next the Sun; the Stalk is very long and slender; the Flesh is breaking, and the Juice is musky: This ripens the End of August. The Shoots and the Leaves of this Tree are large.

22. *PYRUS sativa, fructu æstivo globoso albido saccharato. Tourn.* Poire du Pouchet. This is a large round whitish Pear, shaped somewhat like the Besideri; the Flesh is soft and tender, and the Juice is sugary. This ripens the End of August.

23. *PYRUS sativa, fructu æstivo turbinato sessili saturatus rubente punctato. Tourn.* Poire de Parfum, *i. e.* The perfumed Pear. This is a middle-sized round Fruit, whose Skin is somewhat thick and tough, and of a deep red Colour spotted with brown; the Flesh is melting, but dry, and has a perfumed Flavour. This ripens the End of August.

24. *PYRUS sativa, fructu æstivo oblongo magno, partim rubro, partim albido, odorato. Tourn.* Bon-crétien d'Été, *i. e.* The Summer Boncrétien, or Good Christian. This is a large oblong Fruit, whose Skin is smooth and thin; the Side next the Sun is of a beautiful red Colour, but the other Side is of a whitish green; the Flesh is between breaking and tender, and is very full of Juice, which is of a rich perfumed Flavour. It ripens the Beginning of September.

25. *PYRUS sativa, fructu æstivo globoso, ex rubro albidoque flavescente saccharato odorato. Tourn.* Salviati. This Pear is pretty large, round, and flat, very much like the Besideri in Shape, but not in Colour; the Stalk is very long and slender, and the Fruit is a little hollowed both at the Eye and Stalk; the Colour is red and yellow next the Sun, but on the other Side is whitish; the Skin is rough; the Flesh is tender, but a little soft, and has no Core; the Juice is sugary and perfumed, somewhat like the Robine, but is not near so moist. This ripens the Beginning of September.

26. *PYRUS sativa, fructu æstivo globoso sessili rufescente odorato. Tourn.* Caillot-Rosat, *i. e.* Rose-water Pear. This is a large round Pear, somewhat like the Messire-Jean, but rounder; the Stalk is very short, and the Fruit is hollowed like an Apple, where the Stalk is produced; the Skin is rough, and of a brown Colour; the Flesh is breaking, and the Juice is very sweet. This ripens the Middle of September.

27. *PYRUS sativa, fructu æstivo longo, acerbitate strangulationem minitante. Tourn.* Poire d'Etrangillon, *i. e.* The Choaky Pear; the Flesh is red. This is seldom preserved in Gardens, so it needs no Description.

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28. *PYRUS sativa, fructu aestivo oblongo è ferrugineo rubente, nonnunquam maculato.* Poire du Roufflet, *i. e.* The Rufflet Pear. This is a large oblong Pear; the Skin is brown and of a dark red Colour next the Sun; the Flesh is soft and tender, without much Core; the Juice is agreeably perfumed, if gathered before it be too ripe. This produces larger Fruit on an Espalier than on Standard Trees: it ripens the Middle of September.

29. *PYRUS sativa, fructu aestivo subrotundo, partim rubro, partim flavescente, odorato.* Poire de Prince, *i. e.* The Prince's Pear. This is a small roundish Pear, of a bright red Colour next the Sun, but of a yellowish Colour on the opposite Side; the Flesh is between breaking and melting; the Juice is very high flavoured: It is a great Bearer. This ripens the Middle of September, but will keep a fortnight good, which is what few Summer Fruits will do.

30. *PYRUS sativa, fructu aestivo globoso viridi, in ore liquecente.* Gros Mouille-bouche, *i. e.* The great Mouthwater Pear. This is a large round Pear with a smooth green Skin; the Stalk is short and thick; the Flesh is melting, and full of Juice, if gathered before Apple; it be too ripe, otherwise it is apt to grow mealy. This ripens the Middle of September.

31. *PYRUS sativa, fructu aestivo rotundo sessili saccharato, è viridi flavescente.* Bergamotte d'Été, *i. e.* Summer Bergamot; this is by some called the Hamden Bergamot. It is a pretty large round flat Pear, of a greenish yellow, and hollowed a little at both Ends like an Apple; the Flesh is melting, and the Juice highly perfumed. It ripens the Middle of September.

32. *PYRUS sativa, fructu autumnali sessili saccharato odorato è viridi flavescente, in ore liquecente.* Tourn. Bergamotte d'Automne, *i. e.* The Autumn Bergamot. This is a smaller Pear than the former, but is nearly of the same Shape; the Skin is of a yellowish green, but changes to a faint red on the Side next the Sun; the Flesh is melting, and its Juice is richly perfumed. It is a great Bearer, ripens the End of September, and is one of the best Pears of the Season.

33. *PYRUS sativa, fructu autumnali turbinato viridi, striis sanguineis distincta.* Tourn. Bergamotte de Suisse, *i. e.* The Swiss Bergamot. This Pear is rounder than either of the former; the Skin is tough, of a greenish Colour striped with red; the Flesh is melting and full of Juice, but not so richly perfumed as either of the former. It ripens the End of September.

34. *PYRUS sativa, fructu autumnali suavissimo, in ore liquecente.* Tourn. Beurre rouge, *i. e.* The red Butter Pear. It is called l'Amboise, and in Normandy Lambert; as also Beurre gris, *i. e.* The gray Butter; and Beurre vert, *i. e.* The green Butter Pear. All these different Names of Beurres have been occasioned by the Difference of the Colours of the same Sort of Pear, which is either owing to the different Exposure where they grew, or from the Stock, those on free Stocks being commonly of a browner Colour than those on Quince Stocks, whence some Persons have supposed them to be different Fruits, though in Reality they are the same. This is a large long Fruit for the most part of a brown Colour. The Flesh is very melting, and very full of a rich sugary Juice. It ripens the Beginning of October, and,

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when gathered from the Tree, is one of the very best Pears we have.

35. *PYRUS sativa, fructu autumnali turbinato sessili flavescente, è in ore liquecente.* Tourn. Le Doyenne, *i. e.* The Dean's Pear. It is also called by all the following Names; Saint Michel, *i. e.* Saint Michael; Beurre blanc d'Automne, *i. e.* The white Autumn Butter Pear; Poire de Neige, *i. e.* The Snow Pear; Bonne Ente, *i. e.* A good Graft; the Carlisle and Valentia. This is a large fair Fruit, in Shape somewhat like the grey Beurre, but is shorter and rounder; the Skin is smooth, and when ripe, changes to a yellowish Colour; the Flesh is melting, and full of Juice, which is very cold, but it will not keep good a Week after it is gathered, being very subject to grow mealy; it is a very indifferent Fruit. This is a great Bearer, and ripens the Beginning of October.

36. *PYRUS sativa, fructu autumnali longo viridique odorato, in ore liquecente.* Tourn. La verte longue, *i. e.* The long green Pear. It is also called Mouille-bouche d'Automne, *i. e.* The Autumn Mouth-water Pear. This is a long Fruit, which is very green when ripe; the Flesh is melting, and very full of Juice, which, if it grows upon a dry warm Soil, and a free Stock, is very sugary, otherwise it is but a very indifferent Pear. It ripens the Middle of October, but some Years they will keep till December.

37. *PYRUS sativa, fructu autumnali tuberoso sessili saccharato, carne durâ.* Tourn. Messire Jean blanc & gris, *i. e.* The white and gray Monsieur John. These although made two Sorts by many Persons, are indubitably the same; the Difference of their Colour proceeding from the different Soils and Situations where they grow, or the Stocks on which they are grafted. This Pear, when grafted on a free Stock, and planted on a middling Soil, neither too wet nor over-dry, is one of the best Autumn Pears yet known; but when it is grafted on a Quince Stock, it is very apt to be stony; or if planted on a very dry Soil, is very apt to be small and good for little, unless the Trees are watered in dry Seasons, which has rendered it less esteemed by some Persons who have not considered the Cause of their Hardness; for when it is rightly managed, there are not many Pears in the same Season to be compared with it. This is a large roundish Fruit, the Skin is rough, and commonly of a brown Colour; the Flesh is breaking, and very full of a rich sugared Juice. It ripens the End of October, and will continue good near a Month.

38. *PYRUS sativa, fructu autumnali globoso ferrugineo, carne tenerâ sapidissima.* Tourn. Muscat fleurî, *i. e.* The flowered Muscat. It is also called Muscat à longue queue d'Automne, *i. e.* The long stalked Muscat of the Autumn. This is an excellent Pear, of a middling Size, and round; the Skin is of a dark red Colour; the Flesh is very tender, and of a delicate Flavour. It ripens the End of October.

39. *PYRUS sativa, fructu autumnali globoso ferrugineo, carne viscidâ.* Tourn. Poire de Vigne, *i. e.* The Vine Pear. This is a round Fruit, of a middling Size; the Skin of a dark red Colour; the Flesh is very melting, and full of a clammy Juice, the Stalk is very long and slender. The Fruit should be gathered before it

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be full ripe, otherwise it grows meally and soon rots. It ripens the End of *October*.

40. *PYRUS sativa, fructu autumnali oblongo, dilute rufescente, saccharato, odoratissimo.* Tourn. Poire Rouffeline, *i. e.* The Rouffeline Pear. It is also called in *Touraine*, Le Muscat à longue queue de la fin d'Automne, *i. e.* The long stalked Muscat of the End of Autumn. This is by some *English* Gardeners called the Brute-bonne, but that is a very different Fruit from this. It is shaped somewhat like the Rouffelet, but the Skin of this is smooth, and of a greenish yellow from the Sun, but the Side next the Sun is of a deep red Colour, with some Spots of gray; the Flesh is very tender and delicate; the Juice is very sweet, with an agreeable Perfume. It ripens the Middle of *October*, but must not be long kept, lest it rot in the Middle.

41. *PYRUS sativa, fructu autumnali oblongo majori cinereo.* Tourn. Poire Pendar, *i. e.* The Knave's Pear. This is very like the Cassiolette Pear, but is somewhat larger; the Flesh is fine and tender; the Juice is very much sugared. It ripens the End of *October*.

42. *PYRUS sativa, fructu autumnali turbinato tuberoso viridi saccharato, in ore liquescente.* Tourn. Sucré vert, *i. e.* The green Sugar Pear. This Pear is shaped like the Winter Thorn, but is smaller; the Skin is very smooth and green; the Flesh is very buttery; the Juice is sugared, and of an agreeable Flavour; but it is sometimes subject to be stony in the Middle, especially if grafted on a Quince Stock.

43. *PYRUS sativa, fructu autumnali tuberosa sessili, & viridi flavescente, maculis nigris conferso, carne tenerâ saccharatâ.* Tourn. La Marquise, *i. e.* The Marquis's Pear. This is often of two different Shapes, according to the Nature of the Soil where they are planted; for when the Soil is dry, the Fruit very much resembles a fine Blanquet; but when the Soil is very rich and moist, it grows much larger. It is a well shaped Pear, flat at the Top; the Eye is small and hollowed; the Skin is of a greenish yellow, a little inclining to red on the Side next the Sun. If this Pear does not change yellow in ripening, it is seldom good; but if it does, the Flesh will be tender and delicate, very full of Juice, which is sugared. It ripens the Beginning of *November*.

44. *PYRUS sativa, fructu autumnali oblongo, partim albido, partim rufescente.* The Chat-brulé, *i. e.* The Burnt Cat. It is also called Pucelle de Xaintonge, *i. e.* The Virgin of Xaintonge. This is a small oblong Pear, shaped much like the Martin Sec, but differs from it in Colour; this being of a pale Colour on one Side, but of a dark brown on the other; the Skin is smooth; the Flesh is tender but dry, and, if kept a short Time, is apt to grow meally. It is in eating the Beginning of *November*.

45. *PYRUS sativa, fructu autumnali globoso sessili, ex albido flavescente.* Le Besidéri. It is so called from *Herri*, which is a Forest in *Bretagne*, between *Rennes* and *Nantes*, where this Pear was found. This is a middle sized round Pear, of a pale green, inclining to a yellowish Colour; the Stalk is very long and slender; the Flesh is dry, and but very indifferent for eating, but it bakes well. It ripens the Middle of *November*.

46. *PYRUS sativa, fructu brumali sessili, & viridi flavescente, maculato, utrinque umbilicato, in ore liquescente.*

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Tourn. The Crasane, or Bergamot Crasane. It is also called Beurré Plat, *i. e.* The flat Butter Pear. This is a middle sized Pear, hollowed at the Crown like an Apple; the Stalk is very long and crooked; the Skin is rough, of a greenish yellow Colour when ripe, covered over with a russet Coat; the Flesh is extremely tender and buttery, and is full of a rich sugared Juice, and is the very best Pear of the Season. This is in eating the Middle of *November*.

47. *PYRUS sativa, fructu brumali turbinato sessili flavescente saccharato odorato, in ore liquescente.* Tourn. Lansac ou la Dauphine, *i. e.* The Lansac or Dauphine Pear. This Pear is commonly about the Size of a Bergamot, of a roundish Figure, flat towards the Head, but a little produced towards the Stalk; the Skin is smooth, and of a yellowish green Colour; the Flesh is yellow, tender, and melting; the Juice is sugared, and a little perfumed; the Eye is very large, as is also the Flower, and the Stalk is long and strait. When this Pear is upon a free Stock, and planted on a good Soil it is one of the best Fruits of the Season; but when it is on a Quince Stock, or upon a very dry Soil, the Fruit will be small, stony, and worth little. It ripens the End of *November*.

48. *PYRUS sativa, fructu brumali oblongo, partim intense, partim dilute ferrugineo, saccharato, odorato.* Tourn. Martin Sec, *i. e.* The Dry Martin. This is sometimes called the Dry Martin of *Champagne*, to distinguish it from another Dry Martin of *Burgundy*. This Pear is almost like the Rouffelet in Shape and Colour, which has occasioned some Persons to give it the Name of Winter Ruffelet. It is an oblong Pear, whose Skin is of a deep russet Colour on one Side, but the other Side is inclining to a red; the Flesh is breaking and fine; the Juice is sugared, with a little Perfume, and if grafted on a free Stock, is an excellent Pear, but if it be on a Quince Stock, it is very apt to be stony. It is in eating the End of *November*, but if they were permitted to hang their full Time on the Tree, will keep good two Months.

49. *PYRUS sativa, fructu brumali magno sessili, & cinereo flavescente.* Tourn. La Villaine d'Anjou, *i. e.* The Villain of Anjou. It is also called Poire Tulipée, *i. e.* The Tulip Pear, and Bigarrade, *i. e.* The Great Orange. This is a large round Pear, with a very long slender Stalk; the Skin is of a pale yellow Colour; the Flesh is breaking, but not very full of Juice. This is in eating the End of *November*.

50. *PYRUS sativa, fructu brumali flavescente odoratissimo, pediculo crassiori.* Tourn. Poire de gros queue, *i. e.* The large stalked Pear. This is a large roundish Pear, with a yellow Skin; the Stalk is very thick, from whence it had the Name; the Flesh is breaking, dry, and has a very musky Flavour; but it is apt to be stony, especially if planted in a dry Soil, or grafted on a Quince Stock, as are most of the perfumed Pears.

51. *PYRUS sativa, fructu brumali turbinato rufescente odorato.* L'Amadote, *i. e.* The Amadot Pear. This is a middle sized Pear, somewhat long, but flat at the Top; the Skin generally rough, and of a russet Colour; the Flesh dry and high flavoured, if grafted on a free Stock. The Wood of this Tree is generally thorny, and is esteemed the best Sort for Stocks to graft the melting

melting Pears upon, because it gives them some of its fine musky Flavour. It is in eating the Beginning of December, but will keep good six Weeks.

52. *PYRUS sativa, fructu brumali, globoso, dilute virente, tuberoso, punctato, in ore liquescente.* Tourn. Petit Oin, *i. e.* Little Lard Pear. It is also called Bouvar and Roufette d'Anjou, *i. e.* The Russet of Anjou; and Amadont; and Merveille d'Hyver, *i. e.* The Wonder of the Winter. This Pear is of the Size and Shape of the Ambret or Leschasserie, but the Skin is of a clear green Colour, and a little spotted; the Stalk is pretty long and slender; the Eye is large, and deeply hollowed; the Flesh extremely fine, and melting; the Juice much sugared, and has an agreeable musky Flavour. It is in eating the Middle of December, and is esteemed one of the best Fruits in that Season. This is better on a free Stock than upon the Quince.

53. *PYRUS sativa, fructu brumali longo & viridi albicante, in ore liquescente.* Tourn. Louisbon, *i. e.* The Good Lewis Pear. This Pear is shaped somewhat like the St. Germain, or the Autumn Verte-longue, but is not quite so much pointed; the Stalk is very short, fleshy, and somewhat bent; the Eye and Flower are small; the Skin is very smooth; the Colour green, inclining to a white when ripe; the Flesh extremely tender and full of Juice, which is very sweet, especially when it grows upon a dry Soil, otherwise it is apt to be very large and ill tasted. It is in eating the Beginning of December.

54. *PYRUS sativa, fructu brumali, tuberoso, & viridi flavescente, punctato, saccharato.* Tourn. Poire de Colmar, *i. e.* The Colmar Pear. It is also called Poire Manne, the Manna Pear, and Bergamotte tardive, the late Bergamot. This Pear is somewhat like a Boncrétien in Shape, but the Head is flat; the Eye is large, and deeply hollowed; the Middle is larger than the Head, and sloped toward the Stalk, which is short, large, and a little bent; the Skin is green with a few yellowish Spots; but is sometimes a little coloured on the Side next the Sun; the Flesh is very tender, and the Juice greatly sugared. It is in eating the End of December, but will keep good till the End of January, and is esteemed one of the best Fruits of that Season.

55. *PYRUS sativa, fructu brumali, globoso, citriforini, flavescente, punctato, in ore liquescente, saccharato, odoratissimo.* Tourn. L'Eschasserie. It is also called Verte-longue d'Hyver, *i. e.* The Winter long green Pear, and Befidéri Landri, *i. e.* The Landry Wilding. This Pear is shaped like a Citron; the Skin is smooth, and of a green Colour, with some Spots while it hangs on the Tree, but as it ripens it becomes yellow; the Stalk is strait and long; the Eye small, and not hollowed; the Flesh melting; and buttery; the Juice sugared, with a little Perfume. It is in eating the latter End of December.

56. *PYRUS sativa, fructu brumali longo, & viridi flavescente, in ore liquescente, saccharato.* Tourn. Le Virgoule, or La Virgouleuse. It is also called Bujaleuf, and Chambrette; and Poire de Glasse, *i. e.* The Ice Pear in Gascoigne; but it is called Virgoule, from a Village of that Name in the Neighbourhood of St. Leonard in Limousin, where it was raised and sent to Paris by the Marquis of Chambret. This Pear is large, long, and

of a green Colour, inclining to yellow as it ripens; the Stalk is short, fleshy, and a little bent; the Eye is of a middling Size, and a little hollowed; the Skin very smooth, and sometimes a little coloured towards the Sun; the Flesh is melting, and full of a rich Juice. It is in eating the latter End of December, and will continue good till the End of January, and is esteemed one of the best Fruits of the Season; but the Tree is very apt to produce vigorous Shoots, and the Blossoms being generally produced at the extreme Part of the Shoot, where they are shortened, the Fruit will be entirely cut away; which is the Reason it is condemned as a bad Bearer; but when it is grafted on a free Stock, it ought to be allowed at least 40 Feet to spread; and if upon a Quince Stock, it should be allowed upwards of 30 Feet, and the Branches trained in against the Espalier or Wall, at full Length, in a horizontal Position, as they are produced. Where this Tree is thus treated, it will bear very plentifully, and the Fruit will be good.

57. *PYRUS sativa spinosa, fructu globoso, sessili, ferrugineo, in ore liquescente, saccharato, odoratissimo.* Tourn. Poire d'Ambrette. This is so called from its musky Flavour, resembling the Smell of the Sweet Sultan Flower, which is called Ambrette in France. It is like the Leschasserie in Shape, but is of a russet Colour; the Eye is larger, and more hollowed; the Flesh is melting, and the Juice richly sugared and perfumed; the Seeds are large and black, and the Cells in which they are lodged very large; the Wood is very thorny, especially when grafted on free Stocks. The Fruit is in eating the latter End of December, and continues good till the latter End of January. It is esteemed a very good Fruit.

58. *PYRUS sativa, fructu brumali, magno, pyramidato, albido, in ore liquescente, saccharato, odorato.* Tourn. Epine d'Hyver, *i. e.* Winter-thorn Pear. This is a large fine Pear, nearly of a pyramidal Figure; the Skin is smooth, and of a pale green Colour, inclining to yellow as it ripens; the Stalk is short and slender; the Flesh melting and buttery; the Juice very sweet, and in a dry Season, highly perfumed; but when it is planted on a moist Soil, or the Season proves wet, it is very insipid, so that it should never be planted on a strong Soil. It ripens the End of December, and will continue good two Months.

59. *PYRUS sativa, fructu brumali longo, & viridi flavescente, in ore liquescente.* Tourn. Le Saint Germain, *i. e.* The St. German Pear. It is also called L'Inconnue de la Fare, *i. e.* The Unknown of La Fare; it being first discovered upon the Banks of a River of that Name, in the Parish of St. Germain. This is a large long Pear, of a yellowish green Colour when ripe; the Flesh is melting, and very full of Juice, which in a dry Season, or if planted on a warm dry Soil, is very sweet; but when planted on a moist Soil, the Juice is very apt to be harsh and austere, which renders it less esteemed by some Persons, though in general it is greatly valued. This is in eating from the End of December till February.

60. *PYRUS sativa, fructu brumali tuberoso subacido flavescente punctato.* Tourn. Saint Austin. This is about the Size of a middling Virgoule Pear, but is somewhat shorter and slenderer near the Stalk; the Skin is of a fine

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Citron Colour, spotted with red on the Side next the Sun; the Flesh is tender, but not buttery, and is pretty full of Juice, which is often a little sharp, which to some Persons is disagreeable, but others value it on that Account. This is in eating in December, and will continue good two Months.

61. *PYRUS sativa, fructu brumali pyramidato, partim purpureo, punctis nigris conferso, flavescente.* Tourn. Boncrétien d'Espagne, *i. e.* The Spanish Boncrétien. This is a large Pear, of a pyramidal Form, of a fine red or purple Colour on the Side next the Sun, and full of small black Spots; the other Side is of a pale yellow Colour, the Flesh breaking, and when it is on a light rich Soil, and grafted on a free Stock, its Juice is very sweet. It ripens in the End of December, and will continue good a Month or six Weeks. If this be grafted on a Quince Stock, it is very apt to be dry and stony. This is a very good Fruit for baking.

62. *PYRUS sativa, fructu brumali, magno, oblongo, turbinato, ferrugineo, utrinque umbilicato.* Tourn. Poire de Livre, *i. e.* The Pound Pear. It is also called Gros Ratteau Gris, *i. e.* The gray raked Pear; and Poire d'Amour, *i. e.* The lovely Pear. In England this is called Parkinson's Warden, or the Black Pear of Worcester. This is a very large Pear, which commonly weighs a Pound or more; the Skin is rough, and of an obscure red Colour on the Side next the Sun, but somewhat paler on the other Side; the Stalk is very short, and the Eye greatly hollowed. This is not fit for eating, but bakes or stews exceeding well, and is in Season from December to March.

63. *PYRUS sativa, fructu brumali parvo flavescente, maculis rubris conferso.* Tourn. Besi de Cassoy, *i. e.* The Wilding of Cassoy, a Forest in Bretagne, where it was discovered, and passes under the Name of Rouffet d'Anjou. It is also called Petit Beurré d'Hyver, *i. e.* Small Winter Butter Pear. This is a small oblong Pear, of a yellowish Colour, spotted with red; the Flesh is melting, and the Juice very rich. It is in eating in December and January. This is a prodigious Bearer, and commonly produces its Fruit in large Clusters, provided it be not too much pruned; for it generally produces its Blossom Buds at the Extremity of its Shoots, which if shortened, the Fruit would be cut away.

64. *PYRUS sativa, fructu brumali turbinato inæquali, ventre tumido, partim purpureo, partim flavescente.* Tourn. Ronville. It is also called Hocrenaille and Martin-fire, *i. e.* The Lord Martin Pear. This Pear is about the Size and Shape of a large Roufflet; the Eye is of a middling Size, and hollowed a little; the Middle of the Pear is generally swelled more on one Side than on the other, but is equally extended towards the Stalk; the Skin is very smooth and soft, and of a lively red Colour next the Sun, but on the other Side it changes yellow as it ripens. The Flesh is breaking and full of a very sweet Juice a little perfumed; if grafted on a Quince Stock, it is very apt to be small and stony.

65. *PYRUS sativa, fructu brumali citriforini flavescente duro moscato odoratissimo.* Tourn. Citron d'Hyver, *i. e.* The Winter Citron Pear. It is also called the Musk Orange Pear, in some Places. This is a pretty large Pear, in Shape and Colour very like an Orange or Citron. The Flesh is hard and dry, and very subject to

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be stony, for which Reasons it is not valued as an eating Pear, but will bake very well. It is in Season from December to March.

66. *PYRUS sativa, fructu brumali oblongo, è viridi flavescente, saccharato, saporis austeri.* Tourn. Roufflet d'Hyver, *i. e.* The Winter Roufflet. This is by some supposed to be the same Pear as the Dry Martin, but it is very different from that in several Particulars. The Colour of this is a greenish yellow, inclining to brown; the Stalk long and slender, and the Flesh buttery and melting, and generally full of a very sweet Juice, but the Skin is apt to contain an austere Juice, so that if it be not pared, it is apt to be disagreeable to many Persons Palates. It is in eating in January and February.

67. *PYRUS sativa Picavienfis, fructu brumali globoso sessili saccharato odorato.* Tourn. Poire Portail, *i. e.* The Gate Pear. This Pear was discovered in the Province of Poitou, where it was so much esteemed, that they preferred it to most other Fruit, though in the Opinion of the most curious Judges, it does not deserve the great Character which is given to it; for it rarely proves good for eating, being generally dry, stony, and hard, unless in extraordinary Seasons, and upon a very good Soil. This must always be grafted on a free Stock, and planted on a light rich Soil; and in very dry Seasons the Trees should be watered, otherwise the Fruit will be stony. It is in Season from January to March, and bakes well.

68. *PYRUS sativa, fructu brumali magno globoso flavescente, punctis rufis conferso.* Tourn. Franc-real. It is also called Fin-d'or d'Hyver, *i. e.* The Golden End of Winter. This is a very large Pear, almost globular; the Skin is yellow spotted with red; the Stalk short, and the Wood of the Tree mealy. The Flesh of this Pear is dry, and very apt to be stony, but it bakes exceeding well, and continues good from January till March.

69. *PYRUS sativa, fructu brumali turbinato sessili sub-acido flavescente, punctis asperioribus conferso.* Tourn. Bergamotte Bugi. It is also called Bergamotte de Païque, *i. e.* The Easter Bergamot. It is a large Pear, almost round, but is a little produced in Length towards the Stalk; the Eye is flat, and the Skin green, having many rough Protuberances like Spots dispersed all over, but, as it ripens, becomes yellowish; the Flesh is breaking, and in a good Season the Juice sweet; but it must have a free Stock, a South-east Wall, and a good Soil, otherwise it is apt to be stony and austere. It is in eating from February till April.

70. *LE MUSCAT D'ALLEMAGNE, i. e.* The German Muscat. This is an excellent Pear, more long than round, of the Shape of the Winter-royal, but is less toward the Eye, is more russet, and of a red Colour next the Sun; it is buttery, melting, and a little musky. This is in eating in March, April, and sometimes in May, if it keeps so long.

71. *LE BERGAMOTTE D'HOLLANDE, i. e.* The Holland Bergamot; it is large and round, of the Shape of the ordinary Bergamot. The Colour is greenish, the Flesh half buttery and tender, the Juice highly flavoured. This is a very good Pear, and will keep till April.

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72. *LE POIRE DE NAPLES, i. e. The Pear of Naples.* This is a pretty large, long, greenish Pear; the Flesh is half breaking; the Juice sweet, and a little vinous. It is in eating in *March*. I am in Doubt whether this Pear is not in some Places taken for a Saint Germain, for there is a Pear in some Gardens, very like the Saint Germain, which will keep till *April*, and this Pear agrees with the Characters of that. It is called in *England* the Easter St. Germain.

73. *PYRUS sativa, fructu brumali magno pyramidato, & flavo nonnihil rubente. Tourn. Boncrétien d'Hyver, i. e.* The Winter Boncrétien Pear. This Pear is very large and long, of a pyramidal Figure; the Skin is of a yellowish Colour, but the Side next the Sun inclines to a soft red; the Flesh is tender and breaking, and is very full of rich sugared Juice. This is esteemed in *France* one of the best Winter Pears, but in *England* is seldom so good; though I am fully satisfied, if it were grafted on a free Stock, and planted in a good Soil, against a Wall exposed to the South-east, and the Branches trained at full Length, it might be rendered more acceptable than it is at present in *England*.

74. *PYRUS sativa, fructu brumali magno, cydoniæ facie, partim flavo, partim purpureo. Tourn. Catillac or Cadillac.* This is a large Pear, shaped somewhat like a Quince; the Skin is for the most part of a yellow Colour, but changes to a deep red on the Side next the Sun; the Flesh is hard, and the Juice austere, but it is a very good Fruit for baking, and being a plentiful Bearer, deserves a Place in every good Collection of Fruit. It will be good from *Christmas* to *April*, or longer.

75. *PYRUS sativa, fructu brumali oblongo flavescente, punctis rubris consperso. La Pastorelle.* This Pear is of the Size and Shape of a fine Roufflet; the Stalk is short and crooked; the Skin somewhat rough, of a yellowish Colour, spotted with red; the Flesh is tender and buttery, and when it grows on a dry Soil, the Juice very sweet; but on a wet Soil, or in moist Years, it is subject to have an austere Taste. This Pear is in eating in *February* and *March*.

76. *PYRUS sativa, fructu brumali sessili, partim flavescente, partim purpurascete. Tourn. La Double Fleur, i. e.* The double-flowering Pear. This is so called, because the Flowers have a double Range of Petals or Leaves. It is a large short Pear; the Stalk long and strait; the Skin very smooth, and of a yellowish Colour, but the Side next the Sun of a fine red or purple. This is by some esteemed for eating, but it is generally too austere in this Country for that Purpose. It is the best Pear in the World for Baking or Composts. It is good from *February* to *May*.

77. *PYRUS sativa, fructu brumali oblongo, partim flavescete, partim purpurascete. Saint Martial.* It is also called in some Places Poiré Angelique, *i. e.* The Angelic Pear. This Pear is oblong, in Shape like the Boncrétien, but not so large, and a little flatter at the Crown; it has a very long Stalk; the Skin is smooth and yellowish, but on the Side next the Sun purplish; the Flesh is tender and buttery, and the Juice very sweet. This is in eating in *February* and *March*, and will keep very long.

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78. *PYRUS sativa, fructu brumali oblongo, partim al-bido, partim purpureo odorato, saccharato. La Poire de Chaumontelle, or Besi de Chaumontelle, i. e.* The Wilding of *Chaumontelle*. This Pear is in Shape somewhat like the Autumn Beurre, but is flatter at the Crown; the Skin is a little rough, of a pale green Colour, but purplish next the Sun; the Flesh is melting; the Juice very rich, and a little perfumed. It is in eating from *November* to *January*, and is esteemed by some as the best late Pear yet known.

79. *PYRUS sativa, fructu brumali globoso sessili cinereo maculis amplis obscurioribus consperso. Tourn. Carmelite.* This is a middle sized Pear, of a roundish Form; the Skin of a gray Colour on one Side, but inclining to a red on the other, having some broad Spots of a dark Colour all over; the Flesh is commonly hard and dry, so that it is not very much esteemed. It is in Season in *March*.

80. *PYRUS sativa, fructu brumali maximo pyramidato, dilute virescente. The Union Pear, otherwise called Dr. Uvedale's St. Germain.* This is a very large long Pear, of a deep green, but the Side next the Sun doth sometimes change to a red as it ripens. This is not fit for eating, but bakes very well; and being a great Bearer, and a very large Fruit, deserves a Place in every good Collection. It is in Season from *Christmas* to *April*.

There are many other Sorts of Pears, which are still continued in some old Gardens; but as those here mentioned are the best Sorts known at present, it would be needless to enumerate a great Quantity of ordinary Fruit; since every one who intends to plant Fruit Trees, will rather choose those which are the most valued, the Expence and Trouble being the same for a bad Sort as a good one. Indeed I have inserted many more than are really worth planting, in order to please such who are fond of Variety; but whoever hath a Mind to make Choice of such only as are good, may easily distinguish them, by attending to the Account given of each Sort, and hereby every Person is at Liberty to please himself; for it is not every one who prefers a Beurré Pear, though it is generally esteemed the very best in its proper Season; there are some who admire the Messire Jean, for the Firmness of its Flesh, which to others is a great Objection; so that as some esteem the breaking, and others the melting Pears, I have distinguished them by their Descriptions in such a Manner, that every one may make Choice of the Kinds which are agreeable to their Palates; and the different Seasons in which each Kind is in eating, being exhibited (allowing a little for the Difference of Seasons, which are earlier some Years than others) it is not very difficult for a Person to make a Collection of good Pears to succeed each other throughout the Season, both for eating and baking.

The Time of each Fruit ripening, as here set down, is taken at a Medium for seven Years, and in the Neighbourhood of *London*, where all Sorts of Fruit generally ripen a Fortnight or three Weeks earlier than in almost any Part of *England*; and it is very obvious to every Person who will attend to the Culture of Fruit Trees, that their Time of ripening is accelerated by long Cultivation; for many of the Sorts of Pears, which some Years past rarely became ripe in *England*, unless against the

the best aspected Walls, are now found to ripen extremely well on Espaliers and Dwarfs; and those Pears which seldom were in eating till *January*, are ripe two Months earlier. There is also a very great Difference in their Time of ripening in different Seasons, for I have known the Fruit of a Pear Tree in one Year all ripe and gone by the Middle of *October*, and the very next the Fruit of the same Tree has not been fit to eat till the End of *December*, so that allowance should be made for these Accidents. The *Besi de Chaumontelle* Pear, about thirty Years past, was seldom fit to eat before *February*, and has continued good till the Middle of *April*; but now this Pear is commonly ripe in *November*; and when planted on a warm Soil, and against a good aspected Wall, is in eating the Middle of *October*. This forwarding of the several Kinds of Pears, may be in some Measure owing to the Stocks upon which they are grafted; for if they are grafted upon early Summer Pear Stocks, they will ripen much earlier than when upon hard Winter Pear Stocks; and if some of the very soft melting Pears were grafted upon such Stocks as are raised from the most austere Fruit, such as are never fit to eat, and of which the best Perry is made, it would improve those Fruits, and continue them much longer good; or if the common free Stocks were first grafted with any of these hard Winter Pears, and when they have grown a Year, then to graft or bud these soft melting Pears upon them, it would have the same Effect; but the Pears so raised will require a Year's more Growth in the Nursery, and consequently cannot be sold at the same Price as those which are raised in the common Method, these requiring to be twice budded or grafted, so that there is double Labour, beside standing a full Year longer; but this Difference in the first Expence of the Trees, is not worth regarding by any Person who is desirous to have good Fruit; for the setting out in a right Way is what every one should be the most careful of, since by mistaking at first, much Time is lost, and an after Expence of new Trees often attends it.

Another Cause of Fruits ripening earlier now than formerly, may be the Length of Time they have been cultivated; for it is certain, that most Sorts of Plants have been greatly forwarded and improved by Culture, within the Space of 30 or 40 Years as may be known from the several Sorts of esculent Plants, which are cultivated in the Kitchen Gardens, and of which there are many annually improving: And if we look back to the best *French* Authors who have written on Fruit Trees, we shall find, that the Times of ripening many Sorts of Pears are put down a Month or six Weeks later about 50 Years ago, than they are now found to ripen about *Paris*; and about *London* it is much the same, for I cannot find they are the least forwarder in ripening at *Paris* than at *London*.

The ripening of these Fruits may also be accelerated by the Method of pruning and managing these Trees, which is greatly improved within the Space of a few Years past; for if we look into the Directions which are given by the best Writers on this Subject, we shall soon discover how little they knew of it 50 Years ago, scarce one of them making any Difference in the Management of the different Kinds of Fruit.

Pears are propagated by budding or grafting them upon Stocks of their own Kind, which are commonly called free Stocks, or upon Quince Stocks, or White-thorn, upon all which these Fruits will take; but the latter Sort of Stock is now seldom used, because they never keep Pace in their Growth with the Fruit budded or grafted upon them; and also because the Fruit upon such Stocks is commonly drier, and apt to be stony. Quince Stocks are greatly used in the Nurseries for all Sorts of Pears which are designed for Dwarfs or Walls, to check the Luxuriancy of their Growth, that they may be kept within Compass better than upon free Stocks. But against the general Use of these Stocks, for all Sorts of Pears indifferently, there are very great Objections: 1st, Because some Sorts of Pears will not thrive upon these Stocks, but in two or three Years decay, or at most will but just keep alive. 2dly, Most Sorts of hard breaking Pears are rendered stony, and good for little; so that, whenever any of them are thus injudiciously raised, the Fruit, although the Kind be ever so good, is condemned as good for nothing by such as are not well acquainted with it, when the Fault is entirely owing to the Stock, on which it was grafted. On the contrary, most melting buttery Pears are greatly improved by being upon Quince Stocks, provided they are planted on a strong Soil; but, if the Ground be very dry and gravelly, no Sort of Pear will do well upon Quince Stocks in such Places.

These general Directions being given, there is no Occasion to repeat any Part of the Method in which these Stocks are raised, and the Fruits budded or grafted thereon, which has been already mentioned under the Article of *Nurseries*.

The Distance, which these Trees should be planted either against Walls or Espaliers, must not be less than 30 Feet, but, if they are planted 40 Feet, it will be better; for, if they have not Room to spread on each Side, it will be impossible to preserve them in good Order, especially those on free Stocks; for the more these Trees are pruned, the more they shoot; and, as I said before, many Sorts of Pears produce their Blossom Buds first at the Extremity of the former Year's Shoots, so that when shortened, the Fruit will be cut away, and this cannot be avoided, where the Trees have not Room allowed in their first Planting.

This Distance, I doubt not, will be objected to by many who have not fully attended to the Growth of these Trees, especially as it hath been the general Practice of most Gardeners to plant them at less than half the Distance here mentioned; but, whoever will be at the Trouble to view any of these Trees which have been some Years standing, will always find, if by Accident, one of them has been planted against a Building, where the Branches have had Room to spread, that this Tree has produced more Fruit than twelve which have been crowded close, and have not Room for their Branches to extend. There are some Pear Trees now growing, which spread more than 50 Feet in Length, and are upward of 20 Feet high, which produce a much greater Quantity of Fruit than three Trees in the same Room would have done, as there are Examples enough to prove, where Trees are planted against Houses

Houses and the Ends of Buildings at about twelve Feet, or much less Distance, because there is Height of Walling for them to grow, which is the Reason commonly given by those who plant them so close together. But one Tree will bear more Fruit, when the Branches are trained horizontally, than three or four whose Branches are led upright, and there never can be any Danger of the upper Part of the Wall being left naked or unfurnished, for I have seen a Pear Tree which has spread more than fifty Feet in width, and covered the Wall upward of thirty-six Feet in Height; this was a Summer *Boncrétien* Pear, and was extremely fruitful, which rarely happens to this Sort when they are not allowed a large Share of Room. The finest Tree of this Sort of Pear, which I ever saw, was a large Standard Tree in my own Possession, whose Stem was not more than ten Feet high, where the Branches came out regularly on every Side, and extended near 30 Feet from the Trunk, many of which were by the Weight of the Fruit in Summer obliged to be supported with Poles all around the Tree toward the Extremity of the Branches to prevent their lying upon the Ground, and this Tree had its Branches so disposed as to form a natural Parabola of 40 Feet in Height, bearing from the lowest to the highest Branches, so that in a kindly Season, when the Blossoms escaped the Frost, it hath produced upward of two thousand Pears, which were much better flavoured than any of the same Sort which I have yet tasted. This Instance I mention only to shew how much one of these Trees will spread, if proper Room be allowed it, and to observe that, as the Branches of this Tree had never been shortened, they were fruitful to their Extremities. This shews the Absurdity of the *French* Gardeners, who do not allow more than 10 or 12 Feet Distance to these Trees, and some of their most improved Writers on this subject have advised the planting an Apple Tree between the Pear Trees, where they are allowed twelve Feet, and yet these Authors afterward say, that a good Pear Tree will shoot three Feet each Way in one Year; therefore, according to their own Observation, the Trees so planted will have their Branches meet in two or three Years at most, and what must be the Case with such Trees in five or six Years is not difficult to know. But this Method of planting has not been peculiar to the *French*, for most of the Gardens in *England* have been little better planted. Indeed, those Persons, who were intrusted with the making and planting most of the *English* Gardens, had but little Skill of their own, so were obliged to follow the Directions of the *French* Gardeners, of whom they had so great an Opinion, as to get their Books translated, and to these have added some trifling Notes, which rather betray their Weakness; for, where they have objected to the little Room allowed to these Trees, they have, at the most, allowed them but three Feet more, whence it is plain, they have not considered the natural Growth of the Trees, and whoever departs from Nature may be justly pronounced an unskilful Gardener.

As most of the *English* Gardens have been made and planted by Persons of little Judgment, it is very rare to find any of them which produce much Fruit, for although many of these Gardens have been totally altered, and new-planted, yet they have seldom been much

altered for the better; the Possessors have been put to the Expence of removing the old Trees, and the Earth of their Borders, and purchase new which have been planted perhaps a Foot or two farther asunder, than the old Trees, but when the young Trees have grown a few Years, they were in the same Condition as the old, and so many Years lost to the Owner; but this will constantly be the Case, when it is the Interest of the Person employed, to sell so many young Trees, and plant three Times the Number that is proper, though in many Instances I should be inclinable to think he has proceeded from Ignorance, rather than Design.

But where Fruit Trees have been thus injudiciously planted, if the Stocks are healthy and good, the best Way is to dig up two or three, and leave every third or fourth Tree, according to the Distance they were planted, and spread down the Branches of those which are left horizontally, I mean, all such as are capable of being so brought down; but those, which are too stubborn for this, should be cut off near the Stem, where there will be new Shoots enough produced to furnish the Wall or Espalier; and, if the Sort of Fruit is not the same as desired, the young Branches may be budded the same Summer, or grafted the following Spring with any other Sort of Pear, and hereby many Years may be saved; for one of these old Trees will spread to a much greater Length, and produce more Fruit, when thus managed, in three Years, than a new Tree will in ten or twelve, especially if the Ground is mended. This is a Method which I have practised with great Success, where I have been employed to amend the Blunders of these great Gardeners, as they are stiled, and hereby the Walls and Espaliers have been well furnished in a few Years.

But the next Thing to be done, after being furnished with proper Trees, is the preparing the Ground to receive them, in doing which, there should be great Regard had to the Nature of the Soil, where the Trees are to grow; for, if it is a strong stiff Land, and subject to Wet in Winter, the Borders should be raised as much above the Level of the Ground as you conveniently can. And if under the good Soil there is a sufficient Quantity of Lime Rubbish, or Stones laid to prevent the Roots of the Trees from running downward, it will be of great Service. The Borders for these should not be less than 8 Feet broad, but, if they are 12, it will be better. And if these Borders be planted with such Sorts of esculent Plants as do not grow large, or whose Roots do not grow deep, or mat together on the Surface, they will do no Harm to the Trees, for they are not so nice in their Culture as Peach and Nectarine Trees, so the turning the Ground and mending it for these Crops, will rather improve than injure the Trees, provided the Plants do not shade them, or are not suffered to stand too long upon the Borders. But all the Cabbage Kind, as also Beans, should be excluded from these Borders, because they root deep in the Ground, and draw much Nourishment from the Trees.

But if the Soil is shallow, and the Bottom Gravel or Chalk, there must be good Earth laid upon the Borders, two Feet and a Half deep; for, if the Ground is not of this Depth the Trees will not thrive well. In doing of this, I must caution every Person not to dig out the Gravel in a Trench (as is by some practised), and fill this

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Trench with good Earth, for by so doing, when the Roots of the Trees are extended to the Width of the Trench, they will meet with the Gravel which will stop them, as if they were in Tubs of Earth, whereby the Trees will be soon spoiled; therefore when the Gravel or Chalk is removed, it should be entirely taken away over the whole Garden, otherwise it will be better to raise the whole Border above it.

If the Garden is to be new-made from a Field, all the good Earth on the Surface should be carefully preserved, and, if the good Ground is taken out where the Walks are designed to be made, and laid on the Borders, or in the Quarters, it will add to the Depth of the Soil, and save Expence in bringing in new Earth. If the Ground can be prepared one Year before it is planted, the Trees will thrive the better, for by laying the Ground in Ridges, and turning it over two or three Times, will the Soil loosen, and be much better for planting; but in trenching, or ploughing the Ground, there should be great Care taken not to go deeper than the Ground is good, otherwise all the good Soil will be buried below the Roots, and the bad Ground turned on the Top, which is what I have known done at a great Expence by Persons, at the Top of their Profession, and thereby ruined the Gardens.

Where there is a Necessity of bringing in any fresh Earth for the Borders, it will be proper to do it as soon as possible, and mix it with the Surface of the Earth of the Borders, that it may be turned over two or three Times, that the Parts may be well incorporated before the Trees are planted, and, if some very rotten Dung is added to this, it will greatly improve it. In choosing the Earth to be brought into the Garden, there should be this Care, *viz.* That if the natural Soil of the Garden is light and dry, then the new Earth should be loamy and stiff; but where the natural Soil is strong or loamy, the new Earth should be light and sandy, which will loosen the Parts of the natural Soil, and greatly mend it.

There are some who recommend the laying the whole Depth of the Borders with what they call Virgin Earth, that is, such as is taken from a Pasture where the Land has not been ploughed; but if this is not brought into the Garden at least one Year before the Trees are planted, that by turning it over often it may have been sweetened, it will, not be so good as that which is taken from a Kitchen Garden, where the Land is good, and has been well wrought, for by often turning and breaking the Soil, it is better prepared to receive the Trees.

Others recommend the mixing a great Quantity of rotten Dung with the Earth of the Borders, but this is not so proper; for, by making the Ground too rich, it will only encourage the luxuriant Growth of the Trees; therefore it is always better to mend the Borders from Time to Time as they may require, than to add so much Dung in the first making them.

Another Care is required in making the Borders on wet Ground, which is to contrive some covered Drains to convey off the Water in Winter, otherwise, by being detained about the Roots of the Trees, it will greatly prejudice them, and in building the Walls round a Kitchen Garden, where the Ground is inclinable to be

wet, there should be some Arches turned in the Foundations of the Walls, in the lowest Part of the Garden, to let off the wet.

The Manner of preparing these Trees for planting is the same as hath been directed for other Fruit Trees, *viz.* To cut off all the small Fibres from the Roots, and shorten some of the longest Roots, and cut off all the bruised ones, or such as shoot downright; this being done you should plant them in the places intended at the before-mentioned Distance. The best Time to plant these Trees (if upon a middling or dry Soil) is in *October* or *November*, leaving their Heads on till Spring, which should be fastened to the Walls or Stakes to prevent the Wind from disturbing the Roots, and in the Beginning of *March* their Heads should be cut off in the Manner already directed for Peaches and other Fruit Trees, observing to lay some Mulch upon the Surface of the Ground about their Roots when they are planted. In wet Ground the Trees may be planted in *February*, or the Beginning of *March*, any Time before the Buds are much swelled, for these may be cut down when they are planted.

The first Summer after planting, the Branches should be trained to the Wall or Espalier (against which they are planted) in a horizontal Position, as they are produced, without shortning them, and the *Michaëlas* following some of these Shoots should be shortened down to five or six Eyes, in order to obtain a sufficient Quantity of Branches, to furnish the lower part of the Wall or Espalier; but the Shoots ought not to be shortened unless where there is a Want of Branches to fill a Vacancy, therefore the less the Knife is used to these Trees, the better they will succeed, for, whenever the Shoots are stopped, it occasions the Buds immediately below the Cut to send forth two or more Shoots, whereby there will be a Confusion of Branches, and rarely any Fruit is produced with this Management.

The Distance, which the Branches of Pears should be trained, must be proportioned to the Size of their Fruit. Such Sorts whose Fruit are small may be allowed 5 or 6 Inches, but the larger Sorts must not be less than 7 or 8 asunder. If this be duly observed, and the Branches carefully trained horizontally as they are produced, there will be no Occasion for so much cutting as is commonly practised, which, instead of checking their Growth, on the contrary, causes them to shoot the stronger.

It is very surprising to read the tedious Methods, which most of the Writers on Fruit Trees have given for pruning these Trees. By their prolix and perplexed Methods, one would imagine they had endeavourd to render themselves as unintelligible as possible, and this, I am sure, may be affirmed, That it is next to impossible for a Learner ever to arrive at any tolerable Skill in pruning by the tedious and perplexed Directions which are published by Monsieur *Quintiny*, and those who have copied from him; for, as these have all set out wrong, by allowing their Trees less than half the Distance which they should be planted, they have prescribed Rules to keep them within that Compass, which are most absurd, and contrary to all Reason, therefore should not be practised by those Persons who are desirous of having Plenty of Fruit.

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I shall therefore only lay down a few necessary Directions for pruning and managing these Trees, in as few Words as possible, that a Learner may the more easily understand it, and which (together with proper Observations) will be sufficient to any Person in the right Management of them.

Pear Trees generally produce their Blossom Buds first at the Extremity of the last Year's Shoots, so that, if these are shortened, the Blossoms are cut off; but this is not all the Damage, for (as I before said) this occasions the Buds, immediately below the Cut to put forth two or more Shoots, whereby the Number of Branches will be increased, and the Tree crowded too much with Wood; besides, those Buds, which by this Management produce Shoots, would have only produced Curfons and Spurs, upon which the Blossom Buds are produced, if the leading Branch had not been shortened; therefore these should never be stopped, unless to furnish Wood to fill a Vacancy.

It is not necessary to provide a new supply of Wood in Pear Trees, as must be done for Peaches, Nectarines, &c. which only produce their Fruit upon young Wood; for Pears produce their Fruit upon Curfons or Spurs which are emitted from Branches three or four Years old; which Curfons continue fruitful many Years, so that, where these Trees have been skilfully managed, I have seen Branches which have been trained horizontally upwards of 20 Feet from the Trunk of the Tree, and fruitful their whole Length. And if we do but carefully observe the Branches of a healthy Standard Tree, which has been permitted to grow without pruning, we shall find many that are ten or twelve Years old or more, which are very full of these Curfons, upon which a good Number of Fruit is annually produced.

During the Summer Season these Trees should be often looked over to train in the Shoots, as they are produced regularly to the Wall or Espalier, and to displace fore-right and luxuriant Branches as they shoot out, whereby the Fruit will be equally exposed to the Air and Sun, which will render them more beautiful and better tasted than when shaded by the Branches. By thus managing the Trees in Summer, they will always appear beautiful, and in Winter they will want but little Pruning.

Where Pear Trees are thus regularly trained without stopping their Shoots, and have full Room for their Branches to extend on each Side, there will never be any Occasion for disbarking the Branches, or cutting off the Roots (as hath been directed by several Writers on Gardening); which Methods, however they may answer the Intention for the present yet will certainly greatly injure the Trees, as must all violent Amputations, which should be ever avoided, as much as possible, on Fruit Trees, and this, I am sure, can never be wanted, where Trees have been rightly planted, and regularly trained, while young.

The Season for pruning these Trees is any Time after the Fruits are gathered until the Beginning of *March*, but the sooner it is done after the Fruit is gathered, the better, for Reasons already given for pruning Peach Trees; though indeed the deferring of these until Spring, where there are large Quantities of Trees to prune, is not so injurious to them, as to some tender Fruits; but, if the Branches are regularly trained in the Summer,

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and the luxuriant Shoots rubbed off, there will be little left to do to them in Winter.

All the Sorts of Summer Pears will ripen very well either on Standards, Dwarfs, or Espaliers, as will all Autumn Pears upon Dwarfs or Espaliers; but, where a Person is very curious in his Fruit, I would always advise the planting them against Espaliers, in which Method they take up but little Room in a Garden, and, if they are well managed, appear very beautiful, and the Fruit is larger and better tasted than those produced on Dwarfs, as hath been already observed; but some of the Winter Pears must be planted against East, South-east, or South-west Walls, otherwise they will not ripen well in *England* in bad Seasons.

But although this may be the Case with some of the late Winter Pears in very bad Seasons, yet, in general, most Sorts of them will ripen extremely well in all warm Situations, when they are planted in Espalier, and the Fruit will be better flavoured than that which grows against Walls, and will keep much longer good; for, as the Heat against Walls which are exposed to the Sun will be very great at some Times, and at others there will be little Warmth, all Fruit, which grow near them, will be hastened unequally, and therefore never so well flavoured as the same Sorts which ripen well in the open Air, and will decay much sooner; therefore those Winter Pears, which grow in Espalier, may be kept six Weeks longer than those which grow against Walls, which is a very desirable Thing; for to have Plenty of these Fruit at a Season when it is very rare to find any other to supply the Table but Apples, is what all Lovers of Fruit must be greatly pleased to enjoy. This may be effected by planting many of the late Sorts in Espalier, where, although the Fruit will not be so well coloured as those from the Walls, yet they will be found exceeding good. When the *Besi de Chaumontelle* came first to *England*, the Trees were planted in Espalier, and some of them not on a very good Soil, or in a warm Situation, and yet from these Trees I have eaten this Pear in great Perfection in *April*, and sometimes it has kept till *May*; whereas all those which have been since planted against Walls ripen their Fruit by the Beginning of *November*, and are generally gone by the Middle of *December*, nor are they so well tasted as those of the Espaliers.

The *Virgultuse* and *St. Germain*, as also the *Colmar*, are esteemed the most difficult Sorts to ripen their Fruit, yet these I have eaten in great Perfection from Espaliers, and often from Standards where they grew upon a warm Soil, but the Fruit was much smaller on the Standard Trees than those which grew against Walls or Espaliers, but they were full as well flavoured, and some of these Sorts I have eaten good in *April*, which is two Months later than they usually keep; but yet I would not advise the planting of these late Pears in Standards, because they should hang very late on the Trees in Autumn, at which Season the Winds are generally very high, and these Standard Trees being much exposed the Fruit is often blown off before they are ripe, and those of them, which may hang on the Trees, are frequently bruised by being forced against the Branches, by the Winds so that they seldom keep well. I mentioned this, to prove that these Pears

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will ripen very well without the Assistance of a Wall ; so that, if they are planted in Espaliers where the Trees are kept low, the Fruit will not be so much exposed to the strong Winds in Autumn as those on the Standards, therefore can be in no Danger of the Fruit not coming to Perfection, and, as the Trees in Espaliers will be constantly pruned, and managed in the same Manner as those against Walls, the Fruit will be as large on those Trees ; therefore, where a Person has a warm Situation, and a kindly Soil I would not advise him to build Walls on Purpose for Pears, but to plant them against Espaliers, and where any one will be at the Expence to procure plenty of this Fruit, I should advise the having a sufficient Quantity of Reed Mats made to fix against the Back of the Espalier in the Spring, when the Trees are in Blossom, which will screen them from cold Winds, and preserve the tender Fruit until they are past Danger, when the Reeds may be taken down, and put under a Shed to preserve them from the Weather, and, if the Autumn should prove bad, these Reeds may be fixed up again, which will forward the Ripening of the Fruit, and also prevent the Winds from blowing down and bruising it. These Reeds may be purchased for one Shilling per Yard, running Measure, at six Feet and a Half high, and, if they are carefully laid up, and kept from the Weather will last 7 or 8 Years, so that the Expence will not be very great, and, when the Advantages they are of to the Fruit are considered, I believe no Person will object to them.

But after the Fruit is set and growing, there will be farther Care necessary to have the Fruit good, for it is not enough to have preserved a good Crop of Fruit on the Trees, and then leave them entirely to Nature during the Season of their Growth, but there will require some Skill and Attendance to help Nature, or supply the Deficiency of the Seasons ; for beside the pruning and training the Trees in the Manner directed, there will be wanting some Management of their Roots according to the Nature of the Soil, and the Difference of Seasons. In all strong Land, where the Ground is apt to bind very hard in dry Weather, the Surface of the Borders should be now and then forked over to loosen the Earth, which will admit the Showers and large Dews to penetrate and moisten the Ground, and be of great Service to the Trees and Fruit, and prevent the Growth of Weeds. If the Soil is light and dry, and the Season should prove hot and dry, there should be large Hollows made round the Stems of the Trees to hold Water, and into each of these there should be powered 8 or 9 Pots of Water, which should be repeated once in a Week or ten Days during the Months of *June* and *July*, if the Season should continue dry. There should also be some Mulch laid over the surface of these Hollows to prevent the Sun and Air from drying the Ground. Where this is practised, the Fruit will be kept constantly growing, and prove large and plump ; whereas if omitted, the Fruit will often be small, grow crooked, crack, and fall from the Trees. For if the Fruit is once stinted in their Growth, and Rain should fall plentifully after, it will occasion a great Quantity of the Fruit to fall of the Trees ; and those which remain to ripen, will not keep so long, as those which never receive any Check in their Growth ; and it is from

this Cause, that some Years the Fruit in general decays before the usual Time. For after it has been for some Time stinted in its Growth and then the Season proves favourable, whereby it receives a sudden Growth it becomes so replete with Juice, as to distend the Vessels too suddenly, so that they will not be firm, which occasions their Decay ; therefore it is always best to keep the Fruit constantly in a growing State, whereby it will acquire a proper Size, and be rendered better flavoured.

There will also be required some Dressing to the Ground near the Fruit Trees, but this should be laid on in Autumn, after the Trees are pruned. This Dressing should be different, according to the Nature of the Soil ; if the Land is warm and dry, then the Dressing should be of very rotten Dung, mixed with Loam ; and if this is mixed 6 or 8 Months before it is laid on the Borders, and three or four Times turned over, it will be the better ; as will also the Mixture, if it is made with Neats or Hogs Dung, both which are colder than Horse Dung, so more proper for hot Land. But in cold stiff Land, rotten Horse Dung, mixed with light sandy Earth, or Sea Coal Ashes, will be the most proper, as they will loosen the Ground, and warm it.

These Dressings should be repeated every other Year, otherwise the Trees will not thrive so well, nor will the Fruit be so good. For, notwithstanding what many Persons have advanced to the contrary, Experience is against them ; for the finest Fruit in *England*, for Size and Flavour, is produced on Land which is the most dunged and worked. Therefore I would advise trenching the Ground about the Fruit Trees very well every Winter, for I am sure they will find it answer their Expectations, who will practise this Method. Where the Ground in the Quarters is well dressed and trenched, the Fruit Trees will partake of the Benefit ; for as the Trees advance in Growth, their Roots are extended to a great Distance from their Stems ; and it is chiefly from the distant Roots that the Trees are supplied with their Nourishment, therefore the dressing the Borders only, will not be sufficient for Fruit Trees which are old.

In gathering Pears great Regard should be had to the Bud which is formed at the Bottom of the Foot Stalk, for the next Year's Blossoms ; which, by forcing off the Pear before it be mature, is many Times spoiled ; for while the Fruit is growing, there is always a Bud formed by the Side of the Foot Stalk upon the same Spur, for the next Year's Fruit ; so that when the Pears are ripe, if they are gently turned upward, the Foot Stalk will readily part from the Spur, without injuring the Bud.

The Season for gathering all Summer Pears is just as they ripen, for none of these will remain good above a Day or two after they are taken from the Tree ; nor will many of the Autumn Pears keep good above ten Days or a Fortnight, after they are gathered. But the Winter Fruits should hang as long on the Trees as the Season will permit ; for they must not receive the Frost, which will rot them and render their Juices flat and ill tasted ; But if the Weather continue mild until the End of *October*, it will then be a good Season for gathering them in, which must always be done in dry Weather, and when the Trees are perfectly dry.

In doing this, you ought carefully to avoid bruising them. You should therefore have a broad flat Basket to lay them in as they are gathered; and when they are carried into the Store-room, they should be taken out singly, and each Sort laid up in a close Heap on a dry Place, in order to sweat, where they may remain for ten Days or a Fortnight, during which Time the Windows should be open to admit the Air, to carry off the Moisture which is perspired from the Fruit; after this, the Pears should be taken singly, and wiped dry with a woollen Cloth, then packed up in close Baskets, observing to put some Wheat Straw in the Bottoms, and round the Sides of the Baskets, to prevent their bruising against the Baskets. And if some thick soft Paper is laid double or treble all round the Basket, between the Straw and the Pears, it will prevent them from imbibing the musty taste of the Straw, which often penetrates through the Skin so strongly, that when the Fruit is pared, the Taste will remain. You should also observe to put but one Sort of Fruit into a Basket, lest by their different Fermentations, they should rot each other; but if you have enough of one Sort to fill a Basket which holds two or three Bushels, it will be still better. After you have filled the Baskets, you must cover them with Wheat Straw very close, first laying a Covering of Paper two or three Times double over the Fruit, and fasten them down; then place these Baskets in a close Room, where they may be kept dry and from

Frost; but the less Air is let into the Room, the better the Fruit will keep. It will be very necessary to fix a Label to each Basket, denoting the Sort of Fruit therein contained, which will save the Trouble of opening them, whenever you want to know the Sort; besides, they ought not to be opened before their Season to be eaten, for the oftener they are opened, and exposed to the Air, the worse they will keep. I don't doubt but this will be objected to by many, who imagine Fruit cannot be laid too thin; for which Reason, they make Shelves to dispose them singly upon, and are very fond of admitting fresh Air, whenever the Weather is mild, supposing it very necessary to preserve the Fruit; but the contrary is found true, by those who have large Stocks of Fruit laid up in their Storehouses in London, which remain closely shut up for several Months, in the Manner before related; and when these are opened, the Fruit is always found plumper and sounder than any of those Fruits which were preserved singly upon Shelves, whose Skins are always shrivelled and dry. For (as Mr. Boyle observes) the Air is the Cause of Putrefaction; and in order to prove this, that honourable Person put Fruits of several Kinds into Glasses where the Air was exhausted, in which Places they remained sound for several Months, but, on being exposed to the Air, rotted in a very short Time; which plainly shews the Absurdity of the Method now used, to preserve Fruit.

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QUAMOCLIT. See Ipomœa.
QUERCUS. Tourn. Inst. R. H. 582. Tab. 349. L. G. P. 949. [So called of *αἴξω*, Gr. to make rough; either from the Roughness of its Bark, or because of its Austerity.] The Oak Tree; in French, *Chêne*.

The Characters are,

It hath male and female Flowers on the same Tree: The male Flowers are disposed in a loose Katkin; these have an Empalement of one Leaf, divided into 4 or 5 Parts; they have no Petals, but many short Stamina terminated by large Twin Summits. The female Flowers which sit close to the Buds, have a hemispherical thick Empalement of one Leaf, which is rough and entire, almost hiding the Flower, which has no Petal, but a small oval Germen, supporting a single five-pointed Style crowned by single permanent Stigmas. The Germen becomes an oval Nut (or Acorn) with a thick Cover, having one Cell, whose Base is fixed into the Empalement or Cup.

The Species are,

1. *QUERCUS foliis deciduis oblongis, supernè latioribus sinubus acutioribus, angulis obtusis petiolatis glandibus sessilibus.* Oak with oblong deciduous Leaves, broader toward the Top, and having acute Indentures, with obtuse Angles, which have Foot Stalks, and Acorns sitting close to the Branches. *Quercus latifolia* mas, *quæ brevi pediculo est.* C. B. P. 419. Common Oak.

2. *QUERCUS foliis deciduis oblongis obtusis, pinnatis sinuatis petiolis brevissimis, pedunculis glandorum longissimis.* Oak with oblong, obtuse, deciduous Leaves, which

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are winged-sinuated, and have very short Foot Stalks, with a Fruit growing upon long Stalks. *Quercus cum longo pediculo.* C. B. P. 429. Oak with long Foot Stalks to the Acorn.

3. *QUERCUS foliis oblongis sinuatis obtusis perennantibus, pedunculis glandorum longissimis.* Oak with oblong, obtuse, indented Leaves which are ever-green, and very long Foot Stalks to the Acorns. *Quercus latifolia perpetuè virens.* C. B. P. 420. Broad-leaved ever-green Oak.

4. *QUERCUS foliis oblongis obtusè sinuatis, setaceo mucronatis sessilibus, glandibus majoribus.* Oak with oblong, obtusely indented Leaves which have bristly Points, and sit close to the Stalks, with larger Acorns. *Quercus latifolia femina.* C. B. P. 419. Broad-leaved female Oak.

5. *QUERCUS foliis oblongis pinnatis sinuatis, subius tomentosis, glandibus sessilibus calycibus tomentosis.* Oak with oblong Wing-indented Leaves, which are downy on their under Side, and Acorns having woolly Cups sitting close to the Branches. *Quercus foliis molli lanugine pubescentibus.* C. B. P. 420. Oak with soft, hairy, downy Leaves.

6. *QUERCUS humilis, foliis oblongis obtusè dentatis, fructibus sessilibus conglomerationis.* Dwarf Oak with oblong, obtusely indented Leaves, and Fruit growing in Clusters sitting close to the Branches. *Quercus humilis gallicis binis ternis aut plurimis simul junctis.* C. B. P. 420. Dwarf Oak, with Galls growing together by Pairs, by Threes, or in large Clusters.

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7. *QUERCUS foliis oblongis lyrato-pinnatifidis, laciniis transverse acutis, subtus subtomentosis.* L. Sp. Pl. 997. Oak with oblong Leaves which are Lyre-shaped, Wing-pointed, and transverse acute Jags, which are somewhat downy on their under Side. *Quercus calyce bispido, glande minore.* C. B. P. 420. Oak with prickly Cups and smaller Acorns.

8. *QUERCUS foliis pinnato-sinuatis laevibus, fructibus sessilibus.* Prod. Leyd. 80. Oak with smooth Wing-indented Leaves, and Fruit sitting close to the Branches. *Quercus parva sive Phagus Græcorum & Esculus Plinii.* C. B. P. Cut-leaved Italian Oak.

9. *QUERCUS foliis ovato-oblongis glabris, serrato repandis.* Lin. Sp. Pl. 996. Oak with oblong, oval, smooth, sawed Leaves, and reflexed Indentures. *Quercus calyce ebinato, glande majore.* C. B. P. 420. Oak with a prickly Cup and a larger Acorn.

10. *QUERCUS foliis obtusè-sinuatis setaceo-muricatis.* Lin. Sp. Pl. 996. Oak with obtuse sinuated Leaves, terminated by bristly Points. *Quercus Esculi divifurâ, foliis amplioribus aculeatis.* Pluk. Alm. 309. Tab. 54. fig. 4. Oak with broad spiny Leaves, which are divided like the *Esculus*.

11. *QUERCUS foliis obovatis utrinque acuminatis sinuato-serratis, denticulis rotundatis uniformibus.* H. C. 448. Oak with oblong oval Leaves pointed on both Sides, and sawed Sinuses with uniform roundish Indentures. *Quercus castanea foliis procera arbor Virginiana.* Pluk. Alm. 309. The American Chestnut-leaved Oak.

12. *QUERCUS foliis cuneiformibus obsolete trilobis.* Flor. Virg. 117. Oak with Wedge-shaped Leaves, having three worn-out Lobes. *Quercus folio non serrato in summitate quasi triangulo.* Catesb. Car. 1. p. 20. The Black Oak.

13. *QUERCUS foliorum sinibus obtusis, angulis acutis setis terminatis, intermediis vix tridentatis margine integerrimo.* Hort. Cliff. 448. Oak with obtuse Sinuses to the Leaves, acute Angles terminated by Bristles, and an entire Border. *Quercus Virginiana, venis rubris muricata.* Pluk. Alm. 309. Tab. 54. fig. 1. The scarlet Oak of Virginia.

14. *QUERCUS foliis oblique pinnatifidis, sinibus angulisque obtusis.* Lin. Sp. Plant. 996. Oak with oblique many-pointed Leaves, obtuse Sinuses and Angles. *Quercus alba Virginiana.* Catesb. Car. 1. p. 21. Tab. 21. The White Oak of Virginia.

15. *QUERCUS foliis lineari-lanceolatis integerrimis glabris.* Oak with linear Spear-shaped entire smooth Leaves. *Quercus foliis oblongis non sinuatis.* Catesb. Car. 1. p. 17. The Willow-leaved Oak.

16. *QUERCUS foliis oblongo-ovatis subtus tomentosis integerrimis.* Prod. Leyd. 81. Oak with oblong, oval, entire Leaves, downy on their under Side. *Ilex folio angustio non serrato.* C. B. P. 424. The narrow-leaved ever-green Oak.

17. *QUERCUS foliis oblongo-ovatis sinuato-spinosis subtus tomentosis, glandibus pedunculatis.* Sauv. Monsp. 96. Ever-green Oak with oblong oval, prickly, indented Leaves woolly on their under Side, and bears Acorns with Foot Stalks. *Ilex folio agrifolii.* Bot. Monsp. 140. The Holly-leaved ever-green Oak.

18. *QUERCUS foliis ovatis indivisis spinoso-dentatis glabris.* Prod. Leyd. 80. Oak with oval, undivided,

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smooth Leaves, prickly and indented. *Ilex aculeata, cocciglandifera.* C. B. P. 425. Prickly Kermes Oak.

19. *QUERCUS foliis lanceolato-ovatis integerrimis ptiolatis sempervirentibus.* Oak with Spear-shaped, oval, entire Leaves which are ever-green, and have Foot Stalks. *Quercus sempervirens foliis oblongis non sinuatis.* Banist. Ever-green Oak with oblong Leaves which are not sinuated, commonly called Live Oak in America.

20. *QUERCUS foliis ovato-oblongis indivisis serratis subtus tomentosis, cortice rimoso fungoso.* H. C. 448. Oak with oval, oblong, undivided Leaves sawed and woolly on their under Side, and a fungous cleft Bark. *Suber latifolium perpetuo virens.* C. B. P. 424. The broad-leaved ever-green Cork Tree.

The 1st Sort here mentioned, is the most common Oak of this Country, which is so well known as to need no Description; the Leaves of this have pretty long Foot Stalks, and the Acorns have none, but sit close to the Branches.

The 2d Sort is not so common here as the first, but in the Wilds of Kent and Sussex I have seen many large Trees of this Kind. The Leaves are not so deeply sinuated as those of the first, nor so irregular, but the Indentures are opposite, like the Lobes of winged Leaves; these have scarce any Foot Stalks, but sit close to the Branches; the Acorns stand on very long Foot Stalks, in which they differ from the common Sort. The Timber of this Sort is accounted better than that of the first, and the Trees when growing have a better Appearance. These have been generally supposed to be femal Varieties, which have come from Acorns of the same Tree; I was long of this Opinion myself, but having lately seen some young Trees with Acorns upon them, which were raised from Acorns of the second Sort, and finding they retain their Difference, I am inclined to believe they are different.

The 3d Sort grows upon the Apennines, in Swabia and Portugal. The Leaves of this are broader and not so deeply sinuated, as those of the common Oak; they are of a lighter green on their upper Side, and pale on their under; they have very short Foot Stalks, and their Points are obtuse; the Acorns have very long Foot Stalks, which frequently sustain three or four growing in a Cluster.

The 4th Sort grows common in some Parts of France, where it rises to a tall stately Tree. The Leaves are oblong and obtusely sinuated, each Sinus being terminated by a bristly Point; the Acorns are larger than those of the common Oak.

The 5th Sort grows in the South of France and in Italy; the Leaves of this are shorter and broader than those of the common Oak, and are regularly indented on their Sides, the Indentures being opposite, but not deep; they are of a light green, on their upper Side, and covered with a soft Down on their under, standing upon short Foot Stalks; the Acorns grow in Clusters sitting close to the Branches; their Cups are covered with a white Down.

The 6th Sort grows in the South of France and Italy; this is a low bushy Oak, which rises but 6 or 7 Feet high, sending out many slender Branches the whole Length; these are garnished with oblong Leaves, obtusely indented; they are about three Inches long, and one

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one and a Half broad, standing on slender Foot Stalks; the Acorns are small and grow in Clusters, and the Galls grow 3 or 4 together.

The 7th Sort grows in *Burgundy*; the Leaves are oblong and pointed, and frequently indented in the Middle like a Lyre; they are jagged and acute-pointed, a little hoary on their under Side, standing on slender Foot Stalks. The Acorns are small, and have rough prickly Cups.

The 8th Sort grows naturally in *Spain* and *Italy*; the Leaves are smooth, and deeply sinuated like winged Leaves; some of the Sinuses are obtuse, and others end in acute Points; they have very short Foot Stalks; the Branches are covered with a purplish Bark when young; the Acorns are long and slender, the Cups rough and a little prickly, sitting close to the Branches. The Acorns are sweet, and are frequently eaten by the Poor in the South of *France*, who in Times of Scarcity grind them and make Bread with the Flour.

The 9th Sort grows naturally in the *Levant*, from whence the Acorns are annually brought to *Europe*, where they are used for dyeing; these are called *Velani*, and the Tree *Velanida* by the *Greeks*. It is one of the fairest Species of Oak in the World; the Trunk rises as high as the common Oak; the Branches extend very wide on every Side, and are covered with a grayish Bark, intermixed with brown Spots; they are closely garnished with oblong oval Leaves, about 3 Inches long, and almost 2 broad, deeply sawed on their Edges; most of the Saws or Teeth turn backward, and terminate in acute Points. The Leaves are stiff, of a pale green on their upper Side, and downy on their under; the Acorns have very large scaly Cups, which almost cover them; the Scales are ligneous and acute-pointed, standing out a Quarter of an Inch; some of the Cups are as large as middling Apples.

The 10th Sort grows naturally in *Virginia*, and in other Parts of *North America*. This grows to a large Size in the Countries where it naturally grows; the Bark is smooth, of a grayish Colour, but that of the younger Branches is darker; the Leaves are six Inches long, and two and a Half broad where broadest; they are obtusely sinuated, each Sinus ending with a bristly Point, and are of a bright green, standing upon short Foot Stalks. The Leaves continue their Verdure very late in Autumn, so that unless hard Frost comes on early, they do not fall till near *Christmas*, and do not change their Colour long before. The Acorns are a little longer, but not so thick as those of the common Oak.

The 11th Sort grows naturally in *North-America*; of this there seems to be two Kinds, one of which grows to a much larger Size than the other, though this may be occasioned by the Soil in which they grow; for the largest Sort grows in the rich low Lands, where it becomes the largest of any of the Oaks in those Countries. The Wood is not of a fine Grain, but is very serviceable; the Bark is gray and scaly; the Leaves are five or six Inches long, and two Inches and a Half broad in the Middle, indented on the Edges, with many transverse Veins running from the Midrib to the Borders; they are of a bright green, and so nearly resemble those of the Chestnut Tree, as scarcely to be distinguished from it. The Acorns are very large, and

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their Cups short. The Leaves of the other Variety are not so large, nor so strongly veined, and the Acorns are smaller and a little longer, which may arise from the Soil.

The 12th Sort grows naturally on poor Land in most Parts of *North America*; this never grows to a large Size, and the Wood is of no Value. The Bark is of a dark brown Colour; the Leaves very broad at the Top, where they have two waved Indentures, which divide them almost into three Lobes; they diminish gradually to their Base, where they are narrow; they are smooth, of a lucid green, and have short Foot Stalks. The Acorns are smaller than those of the common Oak, and have short Cups.

The 13th Sort grows naturally in *North America*, where it is called the Red Oak, from the Leaves changing to a deep red or purple before they fall off. There has been supposed two Sorts of this Oak, but I believe they are only seminal Varieties; for from the Acorns of the same Tree, I have seen Plants raised, whose Leaves have been of very different Shapes and Sizes, and have varied greatly in their Colour in Autumn, some changing to a bright red or scarlet, and others to a deep purple Colour. This is commonly called the Scarlet Oak here; the Bark of this Tree is very strong, of a dark brown, and is preferred for Tanning Leather, to all the *American* Oaks, but the Wood is soft, spongy, and not durable. The Leaves vary greatly in their Shape and Size, some of them are 8 or 9 Inches long, and 4 or 5 broad, and have several obtuse Sinuses, ending in acute Angles, and some of them end in three Points, with Bristles, but the Borders are entire; they are of a bright green in Spring, gradually growing darker in Summer, and in Autumn change to the Colours before-mentioned. The Acorns also vary in Size and Shape, some of them are smaller, and others shorter and larger than those of the common Oak.

The 14th Sort grows naturally in *North America*, where the Wood is esteemed preferable to any of their other Sorts for Building, being much more durable than any of them. The Bark of this Tree is grayish, the Leaves 6 or 7 Inches long, and 4 broad in the Middle; they are regularly indented almost to the Mid-rib; the Indentures are obtuse, they are of a light-green, and have short Foot Stalks. The Acorns of this greatly resemble those of the common Oak.

The 15th Sort grows naturally in *North America*, where they distinguish two Sorts; one of them is called the *Higbland Willow Oak*, which grows upon poor dry Land; the Leaves are of a pale green and entire, shaped like those of the Willow Tree. The Acorns are very small, but have pretty large Cups.

The other grows in low moist Land, and rises to a much greater Height; the Leaves are longer and narrower, and the Acorns are of the same Size and Shape, so that I suspect their Difference is owing to the Soil in which they grow.

The 16th Sort is generally known by the Title of *Illex*, or ever-green Oak; of this there are several Varieties, which differ greatly in the Size and Shape of their Leaves; but these will all arise from Acorns of the same Tree, nay, the lower and upper Branches of the same Tree,

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Tree, are frequently garnished with Leaves, very different in Size and Shape from each other; those on the lower Branches being much broader, rounder, and their Edges indented and set with Prickles, but those on the upper are long, narrow, and entire; so that I verily believe they are all but one Species, except the Kermes Oak, which is undoubtedly a distinct Sort. The Leaves of this are from 3 to 4 Inches long, and 1 broad near the Base, gradually lessening to a Point; they are of a lucid green on their upper Side, but whitish and downy on their under, standing on pretty long Foot Stalks, and are entire; these remain green all the Year, and do not fall till they are thrust off by young Leaves in the Spring. The Acorns are smaller than those of the common Oak, but of the same Shape.

The 17th Sort is supposed to be a different Sort, but of this I much doubt, having raised some Plants from the Acorns of the 16th, whose Leaves are so like those of this, as not to be distinguished from them; these are shorter and broader than the other, and approach in Shape to those of the Holly Tree, and are also set with Prickles on their Edges.

The 18th Sort is the Oak, from which the Kermes, or what is called Scarlet Grain is collected, which is an Insect that harbours on this Tree. It grows naturally in *Provence* and *Languedoc*, where it is known by the Title of *d'Avaux*. This is of small Growth, seldom rising above 12 or 14 Feet high, sending out Branches on every Side the whole Length, so as to form a bushy Shrub; the Leaves are oval and undivided, smooth on their Surface, but indented on their Edges, which are armed with Prickles like those of the Holly Tree. The Acorns are smaller than those of the common Oak.

The 19th Sort grows naturally in *Carolina* and *Virginia*, where it rises to the Height of 40 Feet. The Grain of the Wood is hard, tough, and coarse; the Bark grayish, the Leaves ovally Spear-shaped, about 3 Inches long and 1 broad; they are entire, and of a dark green, standing upon short Foot Stalks; they are of a thick Consistence, and continue green all the Year. The Acorns are small, oblong, and have short Cups; they are very sweet, so are eaten by the *Indians*, who lay them up in Store for the Winter; they also draw a very sweet Oil for them, little inferior to that of sweet Almonds. This is called the Live Oak in *America*.

The 20th Sort is the Tree whose Bark is the Cork; of this there are two or three Varieties, viz. one with a broad, another with a narrow Leaf, which are ever-green; and there is one or two which cast their Leaves in Autumn, but the broad-leaved ever-green is the most common; the other may probably be only a Variety, arising by Accident. The Leaves of this are oblong, oval, about 2 Inches long, and 1 and a Quarter broad; they are undivided and sawed on their Edges, and have a little Down on their under Sides; their Foot Stalks are very short; these Leaves continue green through the Winter till the Middle of *May*, when they generally fall off just before the new Leaves come out, so that the Trees are very often almost bare for a short Time. The Acorns are very like those of the common Oak.

The exterior Bark of this Tree is the Cork, this is taken off from the Trees every 8 or 10 Years, but there

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is an interior Bark which nourishes the Trees, so that the stripping off the outer, is so far from injuring them, that it is necessary to continue the Trees; for those whose Bark are not taken off, seldom last longer than 50 or 60 Years in Health; whereas the Tree which are barked every 8 or 10 Years, will live a hundred and fifty Years or more. The Bark of the young Trees is porous and good for little, however it is necessary to take it off when the Trees are 12 or 15 Years old, without which the Bark will not be good, and after 8 or 10 Years, the Bark will be fit to take off again; but this second Peeling is of little Use, but the third Peeling the Bark will be in Perfection, and will continue so many Years, for the best Cork is taken from the old Trees. The Time of Year for stripping of this Bark is in *July*, when the second Sap flows plentifully; this is performed with an Instrument, like that used for debarking Oaks. The Ashes of burnt Cork mixed with fresh Butter, and made into an Ointment, is much recommended for the Piles.

All the Sorts of Oaks are propagated by sowing their Acorns, and the sooner they are put into the Ground after they are ripe, the better they will succeed; for they are very apt to sprout where they are spread thin, and if they are laid in Heaps, they ferment and rot in a little Time; therefore the best Season for sowing them is in the Beginning of *November*, by which Time they will be fallen from the Trees.

I shall first give some Directions for raising the several Sorts of Oaks in a Nursery, which are intended to be planted out for Ornament, where their Timber is not to be regarded. These Acorns may be sown in Beds about 4 Feet wide, with Paths of 2 Feet broad between them; in these Beds there may be 4 Rows sown, at about 9 or 10 Inches distant from each other; when the Beds are marked out, there should be Drills drawn with a Hoe in a straight Line, into which the Acorns should be dropped at about 2 or 3 Inches asunder; then they must be carefully covered over with the Earth 2 Inches thick, leaving none of them uncovered, which might tempt the Vermin, for if they once find them out, they will make sad Havock of the Acorns.

In the Spring when the Plants begin to appear, you must carefully clear them from Weeds; and if the Season proves dry, you should refresh them now and then with a little Water, which will greatly promote their Growth. In these Beds the Plants should remain until the following Autumn (observing constantly to keep them clear from Weeds); at which Time you should prepare a Spot of good fresh Earth (in Size proportionable to the Quantity of Plants,) which should be well trenched and levelled; then toward the Middle or latter End of *October*, carefully take up the Plants, so as not to injure their Roots, and plant them out in Rows 3 Feet asunder, and 18 Inches Distance Plant from Plant; observing never to suffer the Plants to abide long out of the Ground, because their Roots would dry and endanger their Growth.

When the Plants have taken Root in this Nursery, they will require little more Care than to keep them clear from Weeds, and dig the Ground between the Rows every Spring; in doing which, you should cut off such Roots as extend very far from the Trunk of the

the Trees, which will render them better for transplanting again; you should also prune off such Side Branches as extend very far, and would retard the upright Shoot; but you should by no Means cut off all the small lateral Branches, some of which are absolutely necessary to detain the Sap for the Augmentation of the Trunk; for I have often observed, where Trees have been thus closely pruned, that their Heads have overgrown their Bodies, so that they have bent downward and become crooked.

When these Trees have remained in the Nursery 3 or 4 Years, they will be large enough to transplant to the Places where they are to remain; for it is not proper to let them grow very large before they are planted out, because these are very hazardous Trees to remove when old, or after they have taken deep Root.

The Season for this Work is in Autumn; at which Time, if they are carefully taken up, there will be little Danger of their not succeeding. In transplanting them, you should by no Means cut their Heads, which is too much practised; all that should be done, must be only to cut off any bruised or ill placed Branches, close to the Place where they are produced; but there can be no greater Injury done to these Trees, than to shorten their Shoots; for when the leading Bud (which is absolutely necessary to draw and attract the Nourishment) is taken off, the Branch often decays entirely, or at least down to the next vigorous Bud.

The Trees thus raised and managed, will (if planted in a proper Soil) grow to a considerable Magnitude, and are very proper for a Wilderness in large Gardens, in Clumps in Parks, &c. but if they are designed for Timber, it is much better to sow the Acorns in the Places where they are to remain; in order to which, you should provide yourself in Autumn with a sufficient Quantity of Acorns, taken from strait, upright, vigorous growing Trees; these should be gathered from under the Trees as soon as may be after they are fallen, and, if possible, in a dry Time, laid thin in some open Room to dry; after which they may be put into dry Sand, and preserved in a dry Place until the Beginning of November, when you should prepare the Ground for planting them.

The Directions before given are designed only for small Plantations in a Garden or Park, which are only for Pleasure; but where these Trees are cultivated with a View to Profit, the Acorns should be sown where the Trees are designed to grow; for those which are transplanted will never grow to the Size of those which stand where they are sown, nor will they last near so long found. For in some Places, where these Trees have been transplanted with the greatest Care, and have grown very fast for several Years after, they are now decaying, when those which remain in the Place where they came up from the Acorns, are still very thriving, and have not the least Sign of Decay. Therefore, whoever designs to cultivate these Trees for Timber, should sow the Acorns on the same Ground where they are to grow; for the Timber of all those Trees which are transplanted, is not near so valuable as that of the Trees from Acorns. I shall therefore add some plain Directions for the sowing of Acorns, and managing the

young Trees during their Minority, until they are out of Danger, and require no farther Care.

The first Thing to be done is, fencing the Ground very well, to keep out cattle, Hares, and Rabbits; for if these get into the Ground, they will soon destroy the young Trees. Indeed they will in a few Years grow to be out of Danger from Hares and Rabbits, but it will be many Years before they will be past Injury from Cattle, if they are permitted to get into the Plantation, therefore durable Fences should be put round the Ground: If in the Beginning a Pale Fence is made about the Land, close at the Bottom and open above, and within the Pale a Quick Hedge planted; this will become a good Fence by the Time the Pale decays, against all Sorts of Cattle, and then the Trees will have got above the Reach of Hares and Rabbits, so they cannot injure them, for the Bark of the Trees will be too hard for them to gnaw.

After the Ground is well fenced, it should be prepared, by ploughing it 3 or 4 Times, and after each Ploughing harrow it well, to break the Clods, and cleanse the Ground from Couch, and the Roots of all bad Weeds. Indeed if the Ground is green Sward, it will be better to have one Crop of Beans, Peas, or Turnips, off the Grounds, before the Acorns are sown, provided these Crops are well hoed to stir the Surface and destroy the Weeds; for the Crop will mend and improve the Land for sowing; but in this Case the Ground should be ploughed as soon as possible, when the Crop is taken off, to prepare it for the Acorns, which should be sown as soon as may be after they are ripe; for although they may be preserved in Sand for some Time, yet they will be apt to sprout; and if so, the Shoots are in Danger of being broken and spoiled; therefore I should advise the sowing early, which is the best Method.

In making Choice of the Acorns, those should be preferred, which are taken from the largest and most thriving Trees. Those of Pollard Trees should always be rejected, though they are generally the most productive of Acorns, but those of the large Trees commonly produce the strongest and most thriving Plants.

The Season for sowing the Acorns being come, and the Ground having been ploughed and levelled smooth, the next Work is to sow the Acorns, which must be done by drawing Drills across the Ground, at about 4 Feet asunder, and 2 Inches deep, into which the Acorns should be scattered at 2 Inches Distance. These Drills may be drawn either with a Drill Plough, or by Hand with a Hoe; but the former is the most expeditious Method, therefore should be preferred. In drawing the Drills, if the Land has any Slope to one Side, these should be made the same Way as the Ground slopes, that there may be no Stoppage to the Wet by the Rows of Plants crossing the Hanging of the Land. This should be particularly observed in all wet Ground, or where the wet is subject to lie in Winter, but in dry Land it is not of much Consequence. When the Acorns are sown, the Drills should be carefully filled in, so as to cover the Acorns securely; for if any of them are exposed, they will entice the Birds and Mice; and if either of these once attack them, they will make great Havock with them.

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The Reason of my directing the Drills to be made at this Distance, is for the more convenient stirring of the Ground between the Rows, to keep the young Plants clear from Weeds; for if this is not carefully done, it cannot be expected that they should make much Progress; and yet this is generally neglected by many who pretend to be great Planters, who are often at a large Expence to plant, but seldom regard them after; so that the young Plants must encounter the Weeds, which frequently are four or five Times the Height of the Plants, and not only shade and draw them, but exhaust all the Goodness of the Ground, and consequently starve the Plants. Therefore, whoever hopes to have Success in their Plantations, should determine to be at the Expence of keeping them clean for 8 or 10 Years after sowing, by which Time the Plants will have obtained Strength enough to keep down the Weeds; the neglecting this has occasioned so many young Plantations to miscarry in divers Parts of England.

About the Middle of April, the young Plants will appear above Ground; but before this, if the Ground should produce many young Weeds, it will be good Husbandry to scuffle the Surface over with Dutch Hoes, in a dry Time, either the latter End of March or the Beginning of April, to destroy them, whereby the Ground will be kept clean, until all the Plants are come up so as to be plainly discerned, by which Time it may be proper to hoe the Ground over again, for by doing it early, while the Weeds are small, a Man will perform more of this Work in 1 Day, than he can in 3 or 4 when they are grown large; besides, there will be great Hazard of cutting off or injuring the young Plants, when they are hid by the Weeds; and small Weeds being cut, are soon dried up by the Sun; but large Weeds often take fresh Root and grow again, especially if Rain should fall soon after, and grow the faster for being stirred; therefore it is not only the best Method, but also the cheapest Husbandry, to begin cleaning early in the Spring, and repeat it as often as the Weeds are produced.

The first Summer, while the Plants are young, it will be the best Way to perform these Hoeings by Hand, but afterward it may be done with the Hoe Plough; for as the Rows are four Feet asunder, there will be Room enough for this Plough to work; and as this will stir and loosen the Ground, it will be of great Service to the Plants; but there will require a little Hand Labour where the Plough is used, in order to destroy the Weeds, which will come up in the Rows between the Plants; for these will be out of the Reach of the Plough, and if they are not destroyed, they will soon overgrow and bear down the young Plants.

After they have grown two Years, it will be proper to draw out some of them, where they grow too close; but in doing this, great Care should be had not to injure the Roots of those left; for as the Plants which are drawn out are only fit for Plantations designed for Pleasure, so these should not be so much regarded in their being removed, as to sacrifice any of those which are designed to remain. In thinning these Plantations, the Plants may the first Time be left about 1 Foot asunder, which will give them Room to grow two or three Years longer, by which Time it may be easy

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to judge which are likely to make the best Trees. Therefore these may be then fixed on, as Standards to remain; though it will be proper to have a greater Number at this Time marked than can be permitted to grow, because some of them may not answer Expectation; and as it will be improper to thin these Trees too much at one Time, the leaving double the Number intended at the second thinning will not be amiss. Therefore, if they are then left at about four Feet Distance in the Rows, they will have Room enough to grow 3 or 4 Years longer; by which Time, if the Plants have made good Progress, their Roots will have spread over the Ground, therefore it will be proper to take up every other Tree in the Rows. But by this I do not mean to be exact in the removing, but to make Choice of the best Plants to stand, which ever Rows they may be in, or if they should not be exactly at the Distance here assigned; all that is designed here, is to lay down general Rules, which should be as nearly complied with as the Plants will permit; therefore every Person should be guided by the Growth of the Trees in the Performance of this Work.

When the Plants have been reduced to the Distance of about 8 Feet, they will not require any more thinning. But in 2 or 3 Years, those which are not to remain will be fit to cut down, to make Stools for Underwood; and those which are to remain, will have made such Progress as to become a Shelter to each other, for this is what should be principally attended to whenever the Trees are thinned; therefore in all such Places as are much exposed to the Wind, the Trees should be thinned with great Caution and by slow Degrees; for if the Air is let too much at once into the Plantation, it will give a sudden Check to the Trees, and greatly retard their Growth; but in sheltered Situations, there need not be so great Caution used.

The Distance which I should choose to allow to these Trees which are designed to remain for Timber is, from 25 to about 30 Feet, which will not be too near, where the Trees thrive well; in which Case their Heads will spread, so as to meet in about 30 or 35 Years; nor will this Distance be too great so as to impede the upright Growth of the Trees. This Distance is intended, that the Trees should enjoy the whole Benefit of the Soil; therefore, after one Crop of the Underwood, or at most two Crops are cut, I would advise the stubbing up the Stools, that the Ground may be entirely clear, for the Advantage of the growing Timber, which is what should be principally regarded; but in general most People have more Regard for the immediate Profit of the Underwood than the future Good of the Timber, and frequently by so doing spoil both; for if the Underwood is left after the Trees have spread so far as that their Heads meet, the Underwood will not be much Worth; and yet, by their Stools being left, they will draw away a great Share of Nourishment from the Timber Trees, and retard them in their Progress.

The Soil in which the Oak makes the greatest Progress, is a deep rich Loam, in which the Trees grow to the largest Size; and the Timber which grows upon this Land, is generally more pliable than that which grows on a shallow or drier Ground, but the Wood

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of the latter is much more compact and hard. Indeed there are few Soils in *England* in which the Oak will not grow, provided there is proper Care taken in its Cultivation, though it will not thrive equally in all Soils; but yet it might be cultivated to a national Advantage upon many large Wastes in several Parts of *England*, as to the great Profit of the Estates where these Tracts of Land now lie uncultivated, and produce nothing to the Owner. And should the present Temper of destroying the Timber of *England* continue in Practice some Years longer, in the same Degree which it has for some Years past, and as little Care taken to raise a Supply, this Country, which has been so long esteemed for its naval Strength, may be obliged to seek for Timber Abroad, or be content with such a naval Strength as the poor Remains of some frugal Estates may have left growing; for as to the large Forests, from whence the Navy has been so long supplied, a few Years will put an End to the Timber there; and how can it be otherwise, when the Persons to whose Care these are committed, reap an Advantage from the Destruction of the Timber?

Before I quit this Subject, I must beg Leave to take Notice of another great Evil, which is of so much Consequence to the Publick, as to deserve their utmost Attention; which is, that of cutting down the Oaks in the Spring of the Year, at the Time when the Sap is flowing. This is done for the Sake of the Bark, which will then easily peel off; and for the Sake of this, I think, there is a Law, whereby People are obliged to cut down their Timber at this Season. But by so doing the Timber is not half so durable as that which is fallen in the winter, so that those Ships which have been built of this Spring-cut Timber, have decayed more in 7 or 8 Years, than others built with Timber cut in Winter, have done in twenty or thirty. This our Neighbours the *French* have experienced, and therefore have wisely ordered, that the Bark should be taken off the Trees, standing, at the proper Time, but the Trees are left till the next, and sometimes until the second Winter, before they are cut down; and the Timber of these are found to be more durable and better for Use, than that of any Trees which have not been peeled.

QUICK. By the Word Quick are generally understood all live Hedges, of whatever Sort of Plants they are composed, to distinguish them from dead Hedges; but, in the more strict Sense of this Word, it is applied to the Hawthorn, or *Mespilus Sylvestris*; under which Name, the young plants or Sets, are commonly sold by the Nursery Gardeners, who raise them for Sale.

In the Choice of these Sets, those which are raised in the Nursery, are to be preferred to such as are drawn out of the Woods; because the latter have seldom good Roots, though as they are larger Plants than are commonly to be had in the Nursery, many people prefer them; but from long Experience I have found, that those Hedges which have been planted with young plants from the Nursery, have always made the best Hedges. Indeed, if persons would have Patience to wait for these from seed, and sow the Haws in the place where the Hedge is designed, these unremoved Plants will make a much stronger and more durable Fence, than those which are transplanted; but I am aware that most people will condemn this Prac-

tice, as tedious; but if the Haws are buried one Year in the Ground, to prepare them for Vegetation before they are sown, it will not be so long before this will become a good fence, as is generally imagined. Nay, from some Trials of this Kind, I have found, that those Plants which have remained where they came up from Seed, have made such Progress as to overtake, in six Years, Plants of two Years Growth, which were transplanted at the Time when these Seeds were sown.

If the Hedges are raised from Seed, it will not be amiss to mix Holly Berries with the Haws; and if so these Berries should also be buried one Year, to prepare them, so that both may come up together the following Spring; and this Mixture of Holly with the Quick, will not only have a beautiful Appearance in Winter, but will also thicken the Hedge at the Bottom, and make it a better Fence.

But where the Hedge is to be planted, the Sets should not be more than three Years old from the Haws; for when they are older, their Roots will be hard and woody; and as they are commonly trimmed off before the Sets are planted, they very often miscarry; and such of them as do live, will not make so good Progress as younger Plants, nor are they so durable; for these Plants will not bear transplanting so well as many others, especially when they have stood long in the Seed Bed unremoved.

The Method of planting, plashing and pruning these Hedges, having been fully explained under the Article *Hedges*, I shall not repeat it here, but shall only beg Leave to add the Method prescribed by *Thomas Franklin, Esq;* for planting these Hedges, which is as follows:

He first set out the Ground for Ditches and Quick 10 Feet in Breadth; he subdivided that, by marking out 2 Feet and a Half on each Side (more or less at Pleasure) for the Ditches, leaving 5 in the Middle between them; then digging up 2 Feet in the Midst of those 5 Feet, he planted the Sets in; which although it required more Labour and Charge, he says, he soon found repaid the Cost. This done he began to dig the Fosses, and to set up one Row of Turfs on the Outside of the said 5 Feet; namely, one Row on each Side thereof, the green Side outmost, a little reclining, so as the Grass might grow.

After this returning to the Place he began at, he ordered one of the Men to dig a Spit of the Under-turf Mould, and lay it between the Turfs placed Edgewise, as before described, upon the 2 Feet, which was purposely dug in the Middle, and prepared for the Sets, which the Planter set with two Quicks upon the Surface of the Earth almost upright, whilst another Workman laid the Mould forwards about 12 Inches, and then set two more, and so continued.

This being finished, he ordered another Row of Turfs to be placed on each Side upon the Top of the former, and filled the Vacancy between the Sets and Turfs as high as their Tops; always leaving the Middle, where the Sets were planted, hollow and somewhat lower than the Sides of the Banks by 8 or 10 Inches, that the Rain might descend to their Roots; which is of great Advantage to their Growth; and far better than the old Way, where the Banks are too much sloping and

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the Roots of the Set are seldom wetted, even in a moist Season, the Summer following; but if it prove dry, many of the Sets, especially the late planted, will perish; and even few of those that had been planted in the latter End of April (the Summer happening to be somewhat dry) escaped.

The planting being thus advanced, the next Care is fencing by setting a Hedge of about 20 Inches high upon the Top of the Bank on each Side thereof leaning a little outwards from the Sets, which will protect them as well (if not better) than a Hedge of 3 Feet or more, standing on the Surface of the Ground; for as these are raised with the Turfs and Sods about 20 Inches, and the Hedge about 20 Inches more, it will make 3 Feet 4 Inches, so as no Cattle can approach the dead Hedge to prejudice it, unless they let their Feet in the Ditch itself, which will be at least a Foot deep; and from the Bottom of the Foss to the Top of the Hedge, about 4 Feet and a Half, which they can hardly reach over to crop the Quick, as they might in the old Way; and besides, such a Hedge will endure a Year longer.

He says, He had a Hedge which stood 5 Years; and though 9 or 10 Feet are sufficient for both Ditches and Banks, yet where the Ground is but indifferent, it is better Husbandry to take 12 Feet, which will allow of a Bank at least 6 Feet broad, and give more Scope to place the dead Hedges farther from the Sets, and the Ditches being shallow will in 2 Years Time graze.

As to the Objection, that taking 12 Feet wastes too much Ground, he affirms that if 12 Feet in Breadth be taken for a Ditch and Bank, there will no more Ground be wasted than by the common Way; for in that a Quick is rarely set, but there are 9 Feet between the dead Hedges, which is entirely lost all the Time of fencing; whereas with double Ditches, there remain at least 18 Inches on each Side where the Turfs were set on Edge, that bear more Grass than when it lay on the Flat.

But, admitting it did totally lay waste 3 Feet of Ground, the Damage were very inconsiderable; since 40 Perches, in Length, 220 Yards, will make Perches 7, 25, 9, or 7 Pole $\frac{1}{2}$; which, at 13 s. and 4d. the Acre, amounts not to 7d. $\frac{1}{2}$ per Annum.

Now that this is not only the best, but cheapest Way of Quick-setting, will appear by comparing the Charge of both.

In the usual Way, the Charge of a 3 Feet Ditch is 4d. per Pole, the Owner providing Sets; if the Workman finds them, he will have for making the said Ditch and setting them, 8d. per Pole; and for Hedging, 2d. that is, for both Sides, 4d. the Pole; which renders

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RACEMIFEROUS signifies bearing in Clusters. **RACEMUS**, a Cluster, is a Stalk divided or branched into several Foot Stalks sustaining the Flowers or Fruits set together, as are the Bunches of Grapes, Currants, &c. The first of these Conditions distinguish-

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the Charge of Hedging, Ditching, and Sets, 12d. the Pole; that is, for 40 Rods in Length 40 s.

Then one Load of Wood out of the Copse costs (with the Carriage, though but 2 or 3 Miles Distance) 10 s. which will seldom hedge above 8 Poles (single Hedge); but allowing to do 10, to fence 40 Poles, there must be at least 8 Loads of Wood, which costs 4 l. making the whole Expence for ditching, fencing, and setting 40 Poles, to be 6 l. reckoning with the least; for scarce any will undertake to do it for less than 3 s. and 6 d. per Pole, and then 40 Poles cost 7 l.

Whereas with double Ditches, both of them, Settings and Sets, will be done for 8 d. the Pole, and the Husbandman get as good Wages as with the single Ditch (for though the Labour about them is more, yet the making the Table is saved,) which costs 1 l. 6 s. and 8 d. and the Hedges being low, they will make better Wages at Hedging for a Penny a Pole, than at 2 d. for common Hedges which comes to 6 s. 8 d. for hedging 40 Poles on both Sides. Thus one Load of Wood will fence 30 Poles at least, and 40 hedged with two Thirds of Wood less than in the other Way, and cost but 1 l. 6 s. 8 d. which makes the other whole Charge of Sets, Ditching, Fencing, and Wood, but 3 l.

QUICK-BEAM. See Sorbus Sylvestris.

QUINCE Tree. See Cydonia.

QUINCUNX ORDER is a Plantation of Trees, disposed originally in a Square, Consisting of 5 Trees, one at each Corner, and a fifth in the Middle, which Disposition, repeated again and again, forms a regular Grove, Wood, or Wilderness, and, when viewed by an Angle of the Square or Parallelogram, presents equal or parallel Alleys.

Or, The Quincunx is the Figure of a Plantation of Trees disposed in several Rows, both Length and Breadthwise, in such Manner, that the first Tree of the second Row commences in the Centre of the Square formed by the two first Trees of the first Row, and the two first of the third, resembling the Figure of the Five at Cards. This regular Disposition of Trees was formerly more regarded than at present, and is still much in Practice in France for planting Trees to form a Grove.

Trees planted in Quincunx are such as are planted in the following Form:

QUINQUEFOLIUM. See Potentilla.

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es it from a Spike, the last from a Panicle.

RADIATED FLOWERS are such as have several Semiflorets set round a Disk in Form of a radiant Star, as are the Flowers of Daisy, Cammomele, &c. These are called radiated discous Flowers, those which have

have no such Ray, are called naked discous Flowers as the Wormwood, Mugwort Tansey, &c.

RADICLE denotes that Part of the Seed of a Plant, which, upon its Vegetation, becomes a little Root, by which the tender Plant at first receives its Nourishment before the After-Root be formed. This is that Part of the Seed, which, in making Malt, shoots forth, and is called the Come or Comb.

RADISH. See Raphanus.

RADISH (HORSE). See Cochlearia.

RAMPIONS. See Campanula radice esculenta.

RAMSONS. See Allium.

RAMUS a Branch is the Division of a Stalk; in Trees it is often called a Bough.

RANDIA. Houst. Gen. Nov. 28. Lin. Gen. Pl. 194.

The Characters are,

The Empalement of the Flower is permanent of 1 Leaf cut into 5 short Segments at the Brim. The Flower is Funnel-shaped, of 1 Petal cut into 5 Parts at the Top; it hath 5 short Stamina terminated by oblong erect Summits, and an oval Germen supporting a cylindrical Style, the Length of the Tube divided into 2 Parts at the Top, crowned by 2 obtuse unequal Stigmas. The Germen afterward becomes an oval Capsule, with 1 Cell having a hard Cover, including many compressed cartilaginous Seeds surrounded with Pulp.

We have but one Species of this Genus at present in the English Gardens.

RANDIA foliis ovatis emarginatis, spinis geminatis, caule fruticoso. Randia with oval Leaves which are indented at the Top, Spines growing by Pairs, and a shrubby Stalk. Randia frutescens spinis bijugis, foliis subrotundis floribus albis. Houst. Mss. Shrubby Randia with double Spines, roundish Leaves, and white Flowers. Sir Hans Sloane titles it *Lycium forte, foliis subrotundis integris, spinis 3 foliis ex adverso sitis*. Vol. I. p. 401. Boxthorn with roundish entire Leaves, which, as well as the Spines, are placed opposite and by Pairs.

This Plant grows naturally at La Vera Cruz, where Dr. Houstoun found it in Plenty, and sent the Seeds to Europe; he gave this Title to the Genus in Honour of Mr. Isidore Rind, a curious Botanist. It was discovered by Sir Hans Sloane in the Island of Barbadoes.

It rises with a shrubby Stalk, to the Height of 10 or 12 Feet, covered with a whitish Bark. The Branches come out opposite from the Side of the Stalk, each Pair crossing the other; the Leaves are of a thick Consistence, about an Inch long, and three Quarters broad, a little indented at the Top, and placed by Pairs standing upon short Foot Stalks. At the Joints immediately under the Leaves are produced 2 short Spines standing opposite. The Flowers are produced from the Side of the Branches; they are small, white, tubulous, and divided at the Brim slightly into 5 Parts. These are succeeded by oval Berries about the Size of a Marble, having a brittle Shell under a thin Skin, with one Cell inclosing many compressed Seeds surrounded with black Pulp. It is propagated by Seeds, which should be sown early in Spring in Pots filled with light fresh Earth, and plunged into a hot Bed of Tanners Bark, observing to water the Earth frequently but gently, to promote the Vegetation of the Seeds. When the Plants come up they must have fresh Air admitted to them

every Day, when the Weather is warm, and must be often refreshed with Water. In about a Month's Time after the Plants come up they will be fit to transplant, when they should be carefully shaken out of the Pots, and each planted into a separate small Pot filled with light fresh Earth, and then plunged into the hot Bed again, where they must be screened from the Sun, until they have taken new Root; after which Time they must have Air and Moisture in Proportion to the Warmth of the Season. The Plants may remain in the hot Bed till toward Michaelmas, when the Nights begin to be cold, at which Time they should be removed into the Stove, and, if they are plunged into the Bark Bed, it will greatly forward their Growth, though they will live in the dry Stove, if kept in a moderate Temperature of Heat. During the two first Seasons, while the Plants are young, it will be proper to keep them constantly in the Stove, but then their Leaves must be washed, whenever they contract Filth; this will bring them forward; but, after the Plants have obtained Strength, they may be exposed every Summer to the open Air in the warmest Part of the Year for 2 or 3 Months, provided they are placed in a warm Situation, but in Winter they must be constantly placed in a Stove, and kept in a moderate Warmth, otherwise they will not live in this Country.

The Leaves of this Plant continue green throughout the Year, which renders it valuable because it makes an agreeable Variety in the Winter Season, when mixed with other tender Plants.

RANUNCULUS. Tourn. Inst. R. H. 285. Tab. 149. Lin. Gen. Pl. 619. [so called, as some say, from Rana Lat. a Frog, on Account of its delighting to grow in moist Places, which Frogs frequent.] Crowfoot.

The Characters are,

The Empalement of the Flower is composed of 5 oval concave Leaves; the Flower has 5 obtuse Petals, which have a narrow Base; each of these have an open Nectarium upon their Tails. It hath many Stamina about half the Length of the Petals, terminated by oblong, erect, Twin Summits, and numerous Germina collected in a Head having no Styles but crowned by small reflexed Stigmas. The Germina afterward become Seeds of uncertain irregular Figures, fastened to the Receptacle by very short foot Stalks.

I shall not here enumerate all the Species of this Genus, many of which are common Weeds in most Parts of England, and several Parts of Europe, therefore shall only mention those Sorts which are cultivated in Gardens.

1. **RANUNCULUS calycibus patulis, pedunculis teretibus, foliis tripartito-multifidis, summis linearibus.** Lin. Flor. Suec. 466. *flore pleno.* Ranunculus with a spreading Empalement, a taper Foot Stalk, many pointed Leaves divided by Trees, and those at the Top linear and bearing a double Flower. *Ranunculus bortenensis erectus, flore pleno.* C. B. P. 179. Upright Garden Ranunculus with a double Flower.

2. **RANUNCULUS calycibus patulis, pedunculis sulcatis, stolonibus repentibus, foliis compositis.** Flor. Suec. 468. *flore pleno.* Ranunculus with a spreading Empalement, furrowed Foot Stalks, creeping Shoots, and compound Leaves with a double Flower. *Ranunculus bortenensis inclians.* C. B. P. 179. Inclining Garden Ranunculus.

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3. *RANUNCULUS foliis radicalibus reniformibus crenatis sublobatis, caulinis triplicatis lanceolatis integerrimis, caule multifloro.* Lin. Sp. Pl. 550. *Ranunculus* with Kidney-shaped lower Leaves, which are crenated and almost divided into Lobes, but those upon the Stalks divided into 3 Spear shaped Lobes which are entire, and many Flowers on a Stalk. *Ranunculus asphodeli radice Creticus.* C. B. P. 181. Asphodel-rooted *Ranunculus* of Crete.

4. *RANUNCULUS foliis omnibus quinatis lanceolatis incisiferratis.* H. C. 229. *Stare pleno.* *Ranunculus* with all the Leaves divided into 5 Spear-shaped Segments which are sawed, and a double Flower. *Ranunculus folio acuminati, flore albo multiplici.* C. B. P. 179. *Ranunculus* with a Wolfsbane Leaf and a double white Flower, commonly called Mountain *Ranunculus*.

5. *RANUNCULUS foliis linearibus sessilibus, caule erecto sulcato pedunculis longissimis.* *Ranunculus* with linear Leaves sitting close to the Stalk, which is erect and furrowed, having very long Foot Stalks to the Flowers. *Ranunculus montanus, folio gramineo.* C. B. P. 181. Mountain *Ranunculus* with a Grass Leaf.

6. *RANUNCULUS foliis supra decompositis, caule simplicissimo unifolio, radice tuberosa.* Hort. Cliff. 230. *Stare pleno.* *Ranunculus* with Leaves which are decomposed above, a single Stalk bearing one Leaf, and a tuberous Root with a double Flower. *Ranunculus rutaceo folio, flore pleno, luteo, minori.* Flor. Bat. 2. 3. Rue-leaved *Ranunculus* with a smaller double yellow Flower.

7. *RANUNCULUS foliis radicalibus reniformibus crenatis incis, caulinis digitatis linearibus, caule multifloro.* H. C. 229. *Stare pleno.* *Ranunculus* with Kidney-shaped, crenated, lower Leaves, those on the Stalks Hand-shaped and linear, and Stalks bearing many Flowers. *Ranunculus dulcis multiflorus.* Tab. Icon. 53. Sweet smelling *Ranunculus* bearing many Flowers.

8. *RANUNCULUS foliis ovatis acuminatis amplexicaulis, caule subunifloro, radice fasciculata.* H. C. 229. *Ranunculus* with oval acute-pointed Leaves which embrace the Stalks, one Flower upon a Stalk, and Roots growing in Bunches. *Ranunculus montanus, folio plantaginis.* C. B. P. 180. Mountain *Ranunculus* with a Plantain Leaf.

9. *RANUNCULUS caule erecto bifolio, foliis multifidis, caulinis alternis sessilibus.* Flor. Leyd. Prod. 492. *Ranunculus* with an erect Stalk bearing two Leaves which are many pointed, those upon the Stalks alternate and sitting close. *Ranunculus Orientalis, aconiti folio, flore maximo.* Tourn. Cor. 22. Eastern *Ranunculus* with a Wolfsbane Leaf and a large Flower.

10. *RANUNCULUS foliis ternatis biternatisque, foliolis trifidis obtusis, caule simplici.* *Ranunculus* with Leaves placed by Threes, which are divided again into twice trifoliate Leaves, ending in three obtuse Points, and a simple Stalk. *Ranunculus asphodeli radice, flore sanguineo.* C. B. P. 281. Asphodel-rooted *Ranunculus* with a bloody Flower.

11. *RANUNCULUS foliis ternatis biternatisque, foliolis trifidis incis, caule inferne ramoso.* Lin. Sp. Pl. 552. *Ranunculus* with trifoliate and twice-trifoliate Leaves, whose Lobes are trifid and cut, and a Stalk branching at the Bottom. This is the Persian *Ranunculus*.

The 1st Sort is a Variety of the common upright Meadow *Ranunculus*, which grows naturally in every Pasture; but as this hath double Flowers, so it is cul-

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tivated in Gardens. The Stalks of this are erect, and rise more than a Foot high; the lower leaves have very long Foot Stalks; they are divided into several Segments, resembling those of the *Aconite*, or Monks-hood; the Leaves toward the Top of the Stalks are cut into linear Segments to the Bottom; the Stalk branches at the Top into several Foot Stalks, which are terminated by double yellow Flowers. These appear in May, and if they stand in a shady Situation, will continue a Month in flower, and many Times in moist Seasons, there are small Flowers rising out of the Middle of the others. This is propagated by parting the Roots in Autumn, and should be planted in the moist Soil and a shady Situation.

The 2d Sort is a Variety of the common creeping Crowfoot, which grows naturally in most Parts of England. The Shoots from the Root of this Sort trail upon the Ground, and put out Roots from every Joint in the Manner of the Strawberry, so that when it is once introduced into a Garden, it will multiply fast enough; the Leaves and Stalks are hairy, the Flowers yellow and double, but small. It flowers the latter End of May.

The 3d Sort grows naturally in Crete; this hath an Asphodel Root; the lower Leaves are large, Kidney shaped, and a little hairy, about 3 Inches long and 4 broad; they are deeply crenated on their Borders, are divided almost into five Lobes, and have long Foot Stalks which are hairy. The Stalks rise about 9 or 10 Inches high, and are garnished with 2 or 3 Leaves, which are cut into three Segments, which are entire; the Top of the Stalk divides into several Foot Stalks, each sustaining a large pale yellow Flower. This Sort flowers the Beginning of June. It is propagated by Offsets from the Roots, as the Garden *Ranunculus*, and should be planted in a warm Border, otherwise the Frost will destroy the Roots.

The 4th Sort grows naturally upon the Alps, with a single Flower, but the double has been obtained by Seeds, and is preserved in many curious Gardens for the Beauty of its Flowers. This is by some Gardeners called the Fair Maid of France; it hath a perennial Root, composed of many strong Fibres; the Leaves are divided into 5 Spear-shaped Lobes; the 4 Side Lobes standing upon Foot Stalks coming from the Side of the principal Foot Stalk, and the Middle one terminates it; they are deeply sawed on their Edges, and have several longitudinal Veins. The Stalks rise a Foot and a Half high and branch out at the Top into three or four Divisions, at each of which there is one Leaf, of the same Shape with the lower, but smaller. The Flowers are pure white and very double, each standing upon a short Foot Stalk. It flowers in May. This is propagated by parting the Roots in Autumn, as soon as the Leaves decay, and should be planted in an East Border, and loamy Soil, not too stiff.

The 5th Sort grows naturally on the Alps; this has a perennial Root, the Leaves are long and narrow like those of Grass, sitting close to the Stalks, which rise a little more than a Foot high; these divide at the Top into 3 or 4 slender Foot Stalks, which are terminated by single yellow Flowers, like those of the common Butter-flower. This flowers the Beginning of May. There

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is a double Flower of this Kind in the *Paris* Garden, but we have not yet got it in *England*.

The 6th Sort grows naturally in *Austria*, and also in the *Levant*. This hath a tuberous Root the Leaves decomposed and smooth; the Stalks rise near a Foot high, and have one Leaf of the same Shape with the lower, but smaller; the Stalk is terminated by one double Flower, about the Size of the common Butterflower, but of a fine bright yellow Colour. This flower, in the End of *May*. It is propagated by Offsets from the Roots in the same Way as the Garden *Ranunculus*, and must be planted in a warm Border, otherwise the Frost will destroy the Roots in Winter.

The 7th Sort is a Variety of the common sweet Wood *Ranunculus*, which hath a double Flower. This is a very hardy Plant, it may be easily propagated by the Root, and should have a loamy Soil and a shady Situation.

The 8th Sort grows naturally upon the *Alps* and *Apennine* Mountains, where it seldom rises more than 6 Inches high; the Leaves are narrow, and but one Flower on a Stalk; but when it is planted in a Garden, the Stalks rise a Foot and a Half high, are garnished with oval, acute-pointed Leaves, 3 Inches long, and one Inch and a Half broad, smooth, of a grayish Colour, and embrace the Stalks with their Base; the Stalks branch out at the Top into several Foot Stalks, each sustaining 1 white Flower. This flower, in the Middle of *April*, and continues near a Month if planted in a shady Place. It is propagated by parting the Roots in Autumn, soon after the Leaves decay, and may be planted on a shady Border, where it will thrive exceedingly.

The 9th Sort was discovered by Dr. *Tournefort* in the *Levant*; this hath a perennial Root, from which arise several Leaves, cut into many Points like those of *Wolfsbane*; the Stalk rises a Foot high, and is garnished with two Leaves which sit close and are alternate. The Stalk is terminated by 1 single yellow Flower, much larger than that of the Butterflower, and blows in *May*. It is propagated by parting the Roots in Autumn, and should be planted in a light loamy Soil.

The 10th Sort is common in the *English* Gardens, and was some Years past more so than at present; for since the *Persian Ranunculus* has been introduced here, and so many fine Varieties have been obtained from Seeds, they have almost banished this out of the Gardens. This hath a grumous Root like the *Persian* Sort, the Leaves are divided by Threes, and those are twice again divided by Threes; they are obtuse pointed; the Stalk rises about 9 Inches high, terminated by one large double red Flower. This appears the latter End of *April*, and has sometimes 1 or 2 very small Flowers, branching out from the Side.

The 11th Sort was originally brought from *Persia*, but since it has been in *Europe*, has been greatly improved by Culture, and many new Flowers obtained from Seeds, among which are many with semidouble Flowers, which produce Seeds; from these such prodigious Varieties of new Flowers are annually obtained, so large, and of such Variety of beautiful Colours as to exceed all other Flowers of that Season, and even vie with the most beautiful Carnations; there are many of

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them finely scented, and the Roots, when strong, generally produce 20 or 30 Flowers on each; which, succeeding each other, continue in Beauty a full Month or longer, according to the Heat of the Season, or the Care taken to defend them from the Injuries of the Weather; all which excellent Qualities have rendered them so valuable, that the old Sorts are almost disregarded, except in some old Gardens.

All the very double Flowers never produce Seeds, so that they are only multiplied by Offsets from their Roots, which they generally produce in great Plenty, if planted in a good Soil and duly attended in Winter. The Season for planting their Roots is in *October*, for if they are planted sooner, they are apt to come up in a short Time, and grow rank before Winter, whereby they will be in greater Danger of suffering by Frost; and if they are planted much later, they will be in Danger of perishing under Ground; so that you should not keep them out of the Ground any longer than the Beginning, or middle of *October*.

The Beds in which the *Persian Ranunculus* Roots are planted, should be made with fresh light sandy Earth at least three Feet deep: The best Soil for them may be composed in this Manner, viz. Take a Quantity of fresh Earth from a rich Upland Pasture, about six Inches deep, together with the green Sward; this should be laid in a Heap to rot for 12 Months before it is mixed, observing to turn it over very often to sweeten it, and break the Clods; to this you should add a fourth Part of very rotten Neats Dung, and a proportionable Quantity of Sea or Drift-sand, according as the Earth is lighter or stiffer; if it be light and inclining to a Sand, there should be no Sand added; but if it be a Hazel Loam, one Load of Sand will be sufficient for 8 Loads of Earth; but if the Earth is strong and heavy, the Sand should be added in a greater Proportion; this should be mixed 8 Months or a Year before it is used, and often turned to unite their Parts well together, before it is put into the Beds.

The Depth which this should be laid in the Beds, must be about 3 Feet; this should be below the Surface, in Proportion to the Dryness or Moisture of the Place where they are situated, which in dry Ground should be 2 Feet 8 Inches, and the Beds raised four Inches above; but in a moist Place they should be 2 Feet 4 Inches below, and 8 above the Ground; and in this Case, it will be very proper to lay some Rubbish and Stones in the Bottom of each Bed, to drain off the Moisture; and if upon this, at the Bottom of the Beds, some very rotten Neats Dung is laid 2 or 3 Inches thick, the Roots will reach this in the Spring, and the Flowers will be the fairer. This Earth I would by no Means advise to be screened very fine, only in turning it over be careful to break the Clods, and throw out all large Stones, which will be sufficient; for if it is made very fine, when the great Rains in Winter come on, it will cause the Earth to bind into one solid Lump, whereby the Moisture will be detained, and the Roots, not being able to extend their tender Fibres, will rot. Of this I have many Examples, but one particularly to my Cost: When I had procured a fine Parcel of these Roots from Abroad, and being desirous of having them thrive very well, I took great Pains to screen the Earth

of my Beds very fine, which I laid above two Feet deep, and planted a good Part of my Roots therein; but the Season advancing, and having a great deal of other Business upon my Hands, I did not screen the Earth of all my Beds, but planted some of them without doing any Thing more than raking them; and the Success was, that the Roots in those Beds which were screened, did great Part of them, entirely rot; and the remaining Part were so weak, as not to produce any good Flowers; whereas those which were planted in the Beds not screened, did thrive and flower very well, and scarce any of the Roots failed, though the Earth of all the Beds was the same, and were in the same Situation, both with regard to Wind and Sun; so that the Damage which those Roots sustained, was owing entirely to the Fineness of the Earth, and this I have several Times since observed in other Gardens.

I am aware, that this Depth of 3 Feet, which I have here directed to make the Beds for these Flowers, will be objected to by many Persons, on Account of the Expence and Trouble of preparing them, as also supposing it unnecessary to make the Beds so deep, for Flowers whose Roots are small; but if they will give themselves the Trouble of making the Experiment, by preparing one Bed in this Manner, and another in the common Way, and plant them both with the same Flowers, they will soon be convinced of their Error, by the Success of the Flowers. For in the Beds which have been prepared of this Depth, I have seen one Root produce upward of 50 Flowers, each of which grew near a Foot high, and were extremely large and fair; whereas in the common Method of Culture, they are thought to do very well, when they produce 8 or 10 Flowers on each Root, and those grow six Inches high; but if a Person will trace the Length of the small Fibres of these Roots, he will find them to extend 3 or 4 Feet downwards. And as it is by these distant Fibres that the Nourishment is taken in, for the Increase and Strength of the Flowers; so if these meet with a poor barren Soil below, they shrink, and the Flowers are starved for Want of proper Nourishment in the Spring, when it is most required.

The Beds being thus prepared, should lie a Fortnight to settle, before the Roots are planted, that there may be no Danger of the Earth settling unequally after they are planted; which would prejudice the Roots, by having hollow Places in some Parts of the Bed, to which the Water would run and lodge, and so rot the Roots in such Places. Then having levelled the Earth, laying the Surface a little rounding, you should mark out the Rows by a Line, at about six Inches Distance each Way, so that the Roots may be planted every Way in straight Lines; then open the Earth with your Fingers at each Cross, where the Roots are to be planted, about 2 Inches deep, placing the Roots exactly in the Middle, with their Crowns upright; then with the Head of a Rake draw the Earth upon the Surface of the Bed level, whereby the Top of the Roots will be about an Inch covered with Earth, which will be sufficient at first. This Work should be done in dry Weather, because the Earth will then work better than if wet; but the sooner after planting there happens to be Rain, the better it will be for the Roots; for if it should

prove dry Weather long after, and the Earth of the Beds be very dry, the Roots will be subject to mould and decay; therefore in such a Case give a little Water to the Beds, if there should no Rain happen in a Fortnight's Time.

When the Roots are thus planted, there will no more be required until the End of *November*, by which Time they will begin to heave the Ground and their Buds appear; when you should lay a little of the same fresh Earth, of which the Beds were composed, about half an Inch thick all over the Beds, which will greatly defend the Crown of the Root from Frost; and when you perceive the Buds to break through this second Covering, if it should prove very hard Frost, it will be very proper to arch the Beds over with Hoops, and cover them with Mats, especially in Spring, when the Flower Buds will begin to appear; for if they are exposed to too much Frost, or blighting Winds at that Season, their Flowers seldom open fairly, and many Times their Roots are destroyed.

In the Beginning of *March* the Flower Stems will begin to rise, at which Time you should carefully clear the Beds from Weeds, and stir the Earth with your Fingers between the Roots, being very careful not to injure them; this will not only make the Beds appear handsome, but also greatly strengthen their Flowers. When the Flowers are past and the Leaves are withered, you should take up the Roots, and carefully clear them from the Earth; then spread them upon a Mat to dry, in a shady Place; after which they may be put up in Bags or Boxes in a dry Room, until the *October* following, which is the Season for planting them again.

These *Persian* Sorts are not only propagated by Offsets from the old Roots, but are also multiplied by Seeds, which the semidouble Kinds produce in Plenty; therefore, whoever is desirous to have these in Perfection, should annually sow their Seeds, from which new Varieties will be every Year produced; but in order thereto, you should be careful in sowing your Seed, or in procuring it from such Persons as understand how to save it; that is, who will be careful not to leave any Flowers for Seeds, but such as have five or six Rows of Petals at least, and are well coloured; for since these Flowers increase plentifully, it is not worth the Trouble to sow any indifferent Seeds, because there can be but little Hopes of obtaining good Flowers from them.

Being prepared with Seeds, about the Middle of *August*, which is the proper Season for sowing them, you should get some large Pots, flat Seed Pans, or Boxes. These should be filled with light rich Earth, levelling the Surface very even; then sow the Seeds thereon pretty thick, and cover it about a Quarter of an Inch with the same light Earth; after which, you should remove these Pots into a shady Situation, where they may have the Morning Sun until ten of the Clock; and if the Season prove dry, you must often refresh them with Water, being very careful not to wash the Seeds out of the Ground. In this Situation the Pots should remain until the Beginning of *October*, by which Time the Plants will begin to come up (though sometimes the Seeds will remain in the Earth until *November*, before they appear;) but then you should remove the Pots into a more open Exposure, where they may have full Sun; which

which at that Time, is necessary to exhale the Moisture of the Earth; but toward the Middle of November, when you are apprehensive of Frost, the Pots should be removed under a common hot Bed Frame, where they may be covered with the Glasses in the Night Time, and in bad Weather; but in the Day, when the Weather is mild, they should be entirely opened, otherwise the Plants will draw up too weak. The only Danger they are in, is from violent Rains and Frosts; the first often rotting the tender Plants, and the Frost will often turn them out of the Ground, therefore they should be carefully guarded against both these.

In the Spring, as the Season grows warm, these Pots should be exposed to the open Air, placing them at first near the Shelter of a Hedge, to protect them from cold Winds; but towards the Beginning or Middle of April, they should be removed again into a more shady Situation, according to the Warmth of the Season; and if it should prove dry, they must be sometimes refreshed with Water; but you should be careful not to give it in great Quantities, which is very apt to rot these tender Roots; and in the latter End of April or Beginning of May, they should be placed where they may have only the Morning Sun; in which Place they may remain till their Leaves decay, when they may be taken out of the Earth, and the Roots dried in a shady Place: after which they may be put up in Bags, and preserved in a dry Place until the October following, when they must be planted in the Manner before directed for the old Roots.

The Spring following, these Roots will flower, at which Time you should carefully mark such of them as are worthy to be preserved; and the single, or bad coloured Flowers may be pulled and thrown away, which is the surest Method of removing them from the good Sorts; for if they are permitted to remain together until their Leaves decay, there may be some Offsets of the bad Sorts mixed with the good Flowers. You should not suffer those Flowers, which you intend to blow fine the succeeding Year, to bear Seeds, but cut off the Flowers when they begin to decay; for those Roots which have produced Seeds, seldom flower well afterwards; nor will the principal old Root, which has flowered strong, ever blow so fair as will the Offsets; which is what should be principally observed, when a Person purchases any of these Roots; and a great Part of the Complaints made by those who have bought these Roots at a dear Rate, is principally owing to this. For the Persons who sold them, being apprized of this Matter, have parted with their old Roots to their Purchasers, and reserved the Offsets for their own Use; which old Roots have often so much degenerated from what they were the preceding Year, as to cause a Suspicion, whether the Persons they were purchased from had not changed the Roots; and this Degeneracy always attends these Flowers, after having flowered extremely large and fair, or that they have been permitted to feed; so that it is absolutely necessary to sow Seeds every Year, in order to preserve a Succession of good Flowers.

The Manner of preparing the Beds, and the Distance and Method of planting the Roots having been already directed, I shall not repeat it here, but will only ob-

serve, that these Flowers being tender, must be protected from hard Frosts, and cutting sharp Winds, especially after Christmas, when their Flower Buds are forming; for if they are neglected at that Season, their Flowers will rarely prove fair; nor should you suffer them to receive too much Wet in Winter or Spring, which is as injurious to them as Frost. In planting these Roots you should observe to place the semidouble Kinds, from which you intend to save Seeds, in separate Beds and not intermix them with the double Flowers, because they will require to be treated in a different Manner; for when the Flowers of the semidouble Kinds begin to fade, you should carefully guard them from Wet; for if they are permitted to receive hard Rains, or are watered at that Season, the Seeds rarely come to Maturity; or are so weak, that scarce one in fifty of them will grow.

When the Seed begins to ripen (which may be easily known, by separating from the Axis and falling) you should look it over every Day, gathering it as it ripens; for there will be a considerable Distance in the Seeds of the same Bed coming to Maturity, at least a Fortnight, and sometimes three Weeks or a Month. When you gather the Seed, it should not be exposed to the Sun, but spread to dry in a shady Place; after which you must put it up where the Vermin cannot come to it until the Time of sowing it.

By this Method of sowing Seeds every Year, you will not only increase your Stock of Roots, but also raise new Varieties, which may be greatly mended by changing the Seeds into fresh Ground; for if a Person continually sows his Seed in the same Garden many Years, they will not produce near so fine Flowers, as if he procured his Seeds at some Distance, which is also the Case with most other Plants.

It will also be necessary to take away all the Earth out of the Beds in which the Roots were blown the preceding Year, and put in new, if you intend to plant *Ranunculus* there again; otherwise they will not thrive near so well, notwithstanding you may add some new Compost to the Beds, and this is what all the curious Florists continually observe.

RAPA. *Tourn. Inst. R. H.* 228. Tab. 112. *Brassica*. *Lin. Gen. Pl.* 734. Turnep; in French, Navet.

The Characters are,

The Empalement of the Flower is 3 leaved, coloured, and erect. The Flower hath 4 plain spreading Petals, which are narrow at their Base and entire. It has four oval Honey Glands, situated between the Stamina and Style, and 6 erect Awl shaped Stamina; the 2 which are opposite are the Length of the Empalement, the other 4 are longer, terminated by erect acute-pointed Summits. It hath a taper Germen, supporting a short thick Style, crowned by an entire headed Stigma. The Germen afterward becomes a long taper Pod depressed on the Sides, opening in two Cells, which are filled with roundish Seeds.

The Species are,

1. RAPA radice orbiculata depressa carnosâ. Turnip with an orbicular, depressed, fleshy Root. This is the *Rapa sativa rotunda radice candidâ*. C. B. P. 89. Garden Turnep with a white Root.
2. RAPA radice oblongâ carnosâ. Turnip with an oblong fleshy Root, *Rapa sativa, oblonga, seu famina*. C. B. P.

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C. B. P. 90. Turnip with an oblong Root, or female Turnip.

3. *RAPA radice fusiformi*. Turnip with a Spindle-shaped Root. *Napus sativa, radice albâ*. C. B. P. 95. Garden Naphew with a white Root, commonly called French Turnip.

The first is the Turnip which is commonly cultivated in the Fields, of which there are the following Varieties, viz. The round red or purple topped Turnip, the green topped Turnip, the yellow Turnip, the black rooted Turnip, and the early Dutch Turnip. The last Sort is commonly sown early in the Spring, to supply the Markets in May and June, but is never cultivated for a general Crop. The red rooted Turnip was formerly more cultivated in England than at present, for since the large green topped Turnip has been introduced, all the skilful Farmers prefer it to the other Sorts; the Roots of this will grow to a large Size, and continue good much longer than the others. The next to this is the red or purple topped Turnip, which will also grow large, and is extremely good for some Time, but the Roots of this will become stringy much sooner than those of the green topped. The long rooted Turnip, the yellow Turnip, and the blackish rooted Turnip, are now rarely cultivated in England, neither of them being so good for the Table or for Feed, as the red and green topped Turnip, though there some few Persons who sow them for the Sake of Variety. The early Dutch Turnip is chiefly sown in the Spring, to supply the Table before any of the Sorts can be procured; and when they are drawn off young, are tolerably good; but if they are left to grow large, they are stringy and very rank.

The French Turnip is not much cultivated in England, but in France and Holland are in great Esteem, especially for Soups; their Roots being small, and boiled whole in the Soup, and so served up to the Table; these must also be used while they are young, otherwise they will become rank and stringy.

These are supposed to be only Varieties, which have accidentally been obtained from Seeds, therefore I have not enumerated them as distinct Species; but yet I am certain they are constant, where Care is taken in saving their Seeds, not to suffer any Mixture to stand for Seeds: I have sown of three or four Sorts several Years, and have always found them retain their Differences; however, it is not easy to determine if some of these were not by Culture first obtained from Seeds of the common white Turnip. The yellow Turnip seems most unlikely to have been an accidental Variety, for I have never known this alter, and the Roots are yellow within, whereas all the others have white Flesh, notwithstanding their Outfides are of very different Colours.

The long rooted Turnip, is, I think, a distinct Species, the Form of the Root, and its Manner of Growth being totally different from the other Sorts. I have seen these Roots as long as those of the Parsnep, and nearly of the same Shape; these run deep into the Ground, so are unfit for feeding Cattle; and unless they are used very young, become strong, so not proper for the Table, which has occasioned their being rejected of late Years.

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The green topped Turnip grows above Ground more than any of the other, which renders it preferable for feeding Cattle, and being the softest and sweetest Root when grown large of any of the Kinds, is most esteemed for the Table; but in very severe Winters, they are in greater Danger of suffering by Frost, than those whose Roots lie more in the Ground, especially if they are not covered by Snow; for when they are frequently hard frozen and thawed, it causes them to rot sooner, than those whose Flesh is less tender and sweet. I have seen the Roots of this Sort, which were more than a Foot Diameter boiled, and were as sweet and tender, as any of the smallest Roots.

Turnips delight in a light, sandy, loamy Soil, which must not be rich; for in a rich Soil they grow rank and are sticky, but if it be moist they will thrive the better in Summer, especially in fresh Land, where they are always sweeter than on an old worn out, or a rich Soil.

The common Season for sowing Turnips, is any Time from the Beginning of June to the Middle of August, or a little later; though it is not advisable to sow them much after, because, if the Autumn should not prove very mild, they will not have Time to apple before Winter, nor will the Roots of those sown after the Middle of July grow very large, unless the Frost keeps off long in Autumn. But, notwithstanding this is the general Season in which the greatest Part of Turnips are sown in the Country, yet about London they are sown successively from March to August, by those who propagate them to supply the Markets; but there is a great Hazard of losing those which are sown early in the Year, if the Season should prove dry, by the Fly, which will devour whole Fields of this Plant while young; so that where a small Quantity for a Family is wanted, it will be absolutely necessary to water them in dry Weather; and where a Person sows those Seeds in April and May, it should always be upon a moist Soil, otherwise they seldom come to good, the Heat of the Weather at that Season being too great for them on a dry Soil; but those which are sown toward the Middle or latter End of June, commonly receive some refreshing Showers to bring them forward: without which, it is very common to have them all destroyed.

These Seeds should always be sown on an open Spot of Ground, for if they are near Hedges, Walls, Buildings, or Trees, they will draw up, and be very long topped, but their Roots will not grow to any Size.

They are sown in great Plenty in the Fields near London, not only for the Use of the Kitchen, but for Food for Cattle in Winter, when there is a Scarcity of other Food; and this Way is become a great Improvement to barren sandy Lands, particularly in Norfolk, where, by the Culture of Turnips, many Persons have doubled the yearly Value of their Ground.

The Land on which this Seed is sown, should be ploughed in April, and twy-fallowed in May, that is, once more ploughed and twice well harrowed, and made very fine; then the Seed should be sown pretty thin (for it being small, a little will sow a large Piece of Ground; two Pounds of this Seed is full sufficient for an Acre of Land, but one Pound is the common Allowance.) The Seed must be harrowed in as soon as sown,

sown, with a short tinned Harrow, and the Ground rolled with a wooden Roll, to break the Clods and make the Surface even. In ten Days or a Fortnight after sowing, the Plants will come up; when if the Season prove dry, they will be in great Danger of being destroyed by the Fly; if it so happen, the Ground must be sowed again; for the Seed being cheap, the chief Expence is the Labour; but the Ground should be first harrowed to loosen it, especially if it is stiff Land.

When the Plants have got four or five Leaves, they should be hoed to destroy the Weeds, and cut up the Plants where too thick, leaving the remaining ones about 6 or 8 Inches asunder each Way, which will be Room enough for the Plants to stand for the first Hoeing; and the sooner this is performed, when the Plants have four Leaves, the better they will thrive; but in the second Hoeing, which must be performed about three Weeks or a Month after the first, they should be cut up, so that the remaining Plants may stand 14 or 16 Inches Distance, or more, especially if they are designed for feeding Cattle; for where they are allowed a good Distance, the Roots will be proportionably large; so that what is lost in Number, will be overgained by their Bulk, which I have often observed. But where they are sown for the Kitchen, they need not be left at a greater Distance than 10 Inches or a Foot, because large Roots are not so generally esteemed for the Table.

It is not many Years since the Practice of sowing Turnips for feeding Cattle, has been of general Use; how it happened that this Improvement was so long neglected in every Part of Europe, is not easy to determine; since it is very plain, that this Piece of Husbandry was known to the Antients. For *Columella*, in treating of Vegetables proper for the Field, recommends the cultivating *Rapa* in Plenty; because (says he) those Roots which are not wanted for the Table, will be eaten by the Cattle. And yet this Plant was not much cultivated in the Fields till of late, nor is the true Method of cultivating Turnips yet known, or at least practised, in some of the distant Counties of England. For in many Places the Seed is sown with Barley in the Spring, and those Plants which come up, and live till the Barley is cut, produce a little Green for the Sheep to pick up, but never have any Roots. In other Places, where the Turnip Seed is sown by itself, the Method of Hoeing them is not understood, so that Weeds and Turnips are permitted to grow together; and where the Turnips come up thick in Patches, they are never thinned; so that they draw up to have long Leaves, but never can have good Roots, which is the principal Part of the Plant, therefore should be chiefly attended to.

The general Method now practised in England, for cultivating this Plant in the Fields, is the same as is practised by the farming Gardeners, who supply the London Markets with these Roots, and is the same as before directed. But it is only within the Compass of a few Years, that the Country People have been acquainted with the Method of Hoeing them; so that the Farmers usually employed Gardeners, who had been bred up in the Kitchen Gardens, to perform this Work. And the usual Price given per Acre, for twice hoeing

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and leaving the Crop clean, and the Plants set out properly, was seven Shillings; at which Price the Gardeners could get so much per Week, as to make it worth their while to leave their Habitations, and practise this in different Counties, during the Season for this Work; which happens, after the greatest Hurry of Business in the Kitchen Gardens is over; so that they usually formed themselves in small Gangs of six or seven, and set out on their different Routs, each Gang fixing at a Distance from the rest, and undertaking the Work of as many Farmers in the Neighbourhood, as they could manage in the Season; but as this Work is now performed by many Country Labourers who do it much cheaper, that Practice is lost to the Kitchen Gardeners.

There has also been another Method practised very lately, by some curious Farmers, in cultivating Turnips; which is, by sowing the Seed in Rows, with the Drill Plough. In some Places, the Rows are sown 3 Feet asunder, in others four, five, and six. The latter has been recommended by some, as the most proper Distance; and although the Intervals are so large, yet the Crop produced on an Acre has been much greater, than upon the same Quantity of Land where the Rows have been but half this Distance; and upon all the Fields which have been tilled, the Crops have greatly exceeded those which have been Hand hoed. The late Lord Viscount Townshend was at the Expence of making the Trial of these two different Methods of Husbandry, with the greatest Care, by equally dividing the same Fields into different Lands, which were alternately sown in Drills, and the intermediate Lands in broad Cast. The latter were hoed by Hand, in the common Method, and the other cultivated by the Hoeing Plough; and when the Roots were fully grown, his Lordship had an equal Quantity of Land, which had been sowed in different Methods, measured, and the Roots drawn up and weighed; and those Roots which had been cultivated by the Plough, were so much larger than the other, that the Crop of one Acre weighed a Ton and a Half more than that of an Acre in the other Husbandry.

But when the Turnips are sown in Drills, they will require to be hoed by Hand, to separate and cut out the Plants, where they are too near in the Rows; and to cut up the Weeds between the Plants, where the Plough cannot reach them. If this is carefully performed, the ploughing the Intervals will encourage the Growth of the Roots, by stirring the Ground, and make it much better for the Crop of Barley, or whatever else is sown the following Spring. This Method of Culture may be supposed to be more expensive than that commonly practised, by those unacquainted with it; but those who have made Trials of both, find the Horse hoeing to be much the cheapest, and by far the best. For the Country People who are employed in Hand hoeing of Turnips, are very apt to hurry over their Work, so that half the Weeds are left growing, and the Plants are seldom singled out so well as they should be; nor are they curious enough to distinguish the Charlock (which is one of the most common Weeds in Arable Land) from the Turnips; so that about the

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Middle

Middle of *September*, it is very common to see the Fields of Turnips, full of the yellow Flowers of the Charlock. Now, in the Horse hoeing, all the Weeds in the Intervals will be entirely destroyed; so that if the few Plants in the Rows of Turnips should be overlooked, they may be easily drawn when they appear; and by this Method, the Land will be sooner and better cleaned from Weeds.

The greatest Evil which attends a Crop of Turnips, is that of the Fly, which usually happens soon after the Plants come above Ground, or while they are in the Seed Leaf; for, after they have put out their rough Leaves pretty strong, they will be past this Danger. This is always in dry Weather, so that, if there happens Rain when the Turnips come up, they will grow so fast, as to be in a few Days out of Danger from the Fly; and it hath been found, that those sown in Drills, have escaped the Fly much better than those sown in broad Cast; but, if Soot is sown along the surface of each Drill, it will be of great Service to keep off the Fly, and a small Quantity of it will be sufficient for a large Field, where the Drills only are to be covered.

Another Danger of the Crops being destroyed is from Caterpillars, which very often attack them, when grown, to have six or eight Leaves on a Plant. The surest Method of destroying these Insects is to turn a large Parcel of Poultry into the Field, which should be kept hungry, and turned early in the Morning into the Field; these Fowls will soon devour the Insects, and clear the Turnips. To this Evil the Turnips, which are sown in Drills, are not so much exposed, for as the Ground between the Rows will be kept stirred, the Plants will be kept growing, so will not be in Danger of suffering from these Insects, for the Parent Insects never deposit their Eggs upon any Plants which are in Health, but as soon as they are stunted, they are immediately covered with the Eggs; and this holds in general with Animals as with Vegetables, who are seldom attacked by Vermin when they are in perfect Health; whereas, when they become unhealthy, they are soon overspread with them, so that it is the Disease which occasions the Vermin, and not the Vermin the Disease, as is commonly imagined. Now as the Plants will always be in greater Health when the Ground is well stirred about them, there will be less Danger of their suffering from these Enemies, when cultivated by the Horse-hoe, than in the common Way.

When the Turnips are sown in Drills, it will be the best Way to hoe between every other Row at first, and some Time after to hoe the alternate Intervals, by which Method the Plants will receive more Benefit from the often stirring the Ground, than if all the Intervals were hoed at one Time, and the Plants will be in less Danger of suffering from the Earth being thrown up too high on some Rows, while others may be left too bare of Earth; but, when the Earth has been thrown up on one Side of the Drill, it may be turned down again before the next Interval is hoed, and this alternate Moving of the Earth will prepare the Ground very well for the succeeding Crop, as well as greatly improve the Turnips; but, as this Plough cannot well be drawn nearer to the Drills than 2 or 3 Inches, the remaining Ground should be forked to loosen the Parts, and make Way for the Fibres of the Roots to strike

out into the Intervals, otherwise, if the Land is strong, it will become so hard in those Places which are not stirred, as to stint the Growth of the Turnips, and this may be done at a small Expence; a good Hand will perform a great deal of this Work in a Day, and, whoever will make the Trial, will find their Account in it, especially on strong Land, where the Turnips are much more liable to suffer from the binding of the Ground, than on a loose Soil, yet, in all Sorts of Ground, it will be of great Service to practise this.

When the Ground is thus stirred in every Part, one Ploughing will be sufficient, after the Turnips are eaten, for the sowing of Barley, or any other Crop; so that there will be an Advantage in this, when the Turnips are kept late on the Ground, as will often be the Case, especially when they are cultivated for feeding Ewes, because it is often the Middle of *April* before the Ground will be cleared; for late Feed in the Spring, before the natural Grass comes up, is the most wanted, where Numbers of Sheep or Ewes are maintained, and one Acre of Turnips will afford more Feed than 50 Acres of the best Pasture at that Season.

In *Norfolk* and some other Countries they cultivate great Quantities of Turnips for feeding black Cattle, which turn to great Advantage to their Farms, for hereby they procure a good Dressing for their Land; so that they have extraordinary good Crops of Barley upon those Lands, which would not have been worth the ploughing, if it had not been thus husbanded.

When the Turnips are fed off the Ground, the Cattle should not be suffered to run over too much of it; for, if they are not confined by Hurdles to as much as is sufficient for them one Day, they will spoil three Times the Quantity of Turnips they can eat, so that it is very bad Husbandry to give them too much Room: therefore the Hurdles should be once or twice every Day removed forward, and, if the Turnips are drawn out of the Ground before the Cattle or Sheep are turned into the new Inclosure, there will be less Waste, for they will then eat up the whole Roots, whereas, if they are turned upon the Turnips growing, they scoop the Roots, and leave the Rinds, which being hollow, the Urine of the Sheep lodge in them; so that, when they are forked out of the Ground, the Sheep will not eat any of those Roots which are thus tainted.

I cannot omit taking Notice of a common Mistake, which has prevailed with Persons who have not been well informed to the contrary, which is, in relation to the Mutton, fatted with Turnips, most People believing it to be rank and ill tasted, whereas it is a known Fact, that the best Mutton this Country affords is all fatted on Turnips, and that rank Mutton, whose fat is yellow, is what the low marshy Lands of *Lincolnshire*, and other rank Pastures, produce.

In order to save good Turnip Seeds, you should transplant some of the fairest Roots in *February*, placing them at least two Feet asunder each Way, observing to keep the Ground clear from Weeds, until the Turnips have spread over the Ground, when they will prevent the Weeds from growing, and, when the Pods are formed, carefully guard them again the Birds who will devour it, when it is near ripe; at which Time you should either shoot the Birds as they alight upon the Seed, or

lay some bird-limed Twigs upon it, whereby some of them will be caught, and, if they are permitted to remain some Time, and afterwards turned loose, they will prevent the Birds from coming thither again for some Time as I have experienced. When the Seed is ripe, it should be cut up, and spread to dry in the Sun; after which it may be threshed out, and preserved for Use.

There have been many Receipts for preventing the Fly taking Turnips, but few of them deserve Notice, therefore I shall only mention two or three which I have seen tried with Success. The first was steeping the Seeds in Water with flower of Brimstone mixed, so as to make it strong of the Brimstone: Another was keeping it in Water with a Quantity of the Juice of Horse Aloes mixed; both which have been found of Use. The sowing of Soot or Tobacco Dust over the young Plants, as soon as they appear above Ground, has also been found very serviceable: In short, whatever will add Vigour to the young Plants will prevent their being destroyed by the Fly, for these never attack them, till they are stunted in their Growth.

RAPHANUS. *Tourn. Inst. R. H.* 229. *Tab.* 114. *Lin. Gen. Plant.* 736. Radish; in French, *Raisfort*.

The Characters are,

The Empalement of the Flower is erect, and composed of 4 oblong Leaves. The Flower has 4 Heart-shaped Petals, in Form of a Cross, which spread open, and are narrow at their Base; it hath 4 Honey Glands, 1 on each Side the short Stamina between them and the Style, and 1 between each of the long Stamina and the Empalement; it hath 6 short Stamina which are erect, 2 opposite, the Length of the Empalement, the other 4 are as long as the Base of the Petals terminated by single Summits, and an oblong swelling Germen, narrowed the Length of the Stamina, with scarce any Style, crowned by a beaded Stigma. The Germen afterward becomes an oblong, smooth, spongy Pod having an acute Point, swelling and almost jointed, having 2 Cells divided by an intermediate Partition, and filled with roundish Seeds.

The Species are,

1. *RAPHANUS radice oblongâ*. Radish with an oblong Root. *Raphanus minor oblongus* C. B. P. 96. Smaller oblong Radish, or the common Radish.

2. *RAPHANUS radice rotundâ*. Round-rooted or Naples Radish.

3. *RAPHANUS radice orbiculatâ depressâ*. Radish with an orbicular depressed Root. *Raphanus major orbicularis, vel rotundus*. C. B. P. 96. Greater, orbicular, or round Radish, commonly called Turnip-rooted, or white Spanish Radish.

4. *RAPHANUS radice fusiformi*. Radish with a Spindle-shaped Root. *Raphanus niger*. C. B. P. 96. The black Spanish Radish.

5. *RAPHANUS siliquis teretibus articulatis lævibus unilocularibus*. H. C. 340. Radish with smooth, taper, jointed Pods having one Cell. *Rapistrum flore albo, siliquâ articulatâ*. C. B. P. 95. White flowering Charlock with a jointed Pod.

The last Sort grows naturally on Arable Lands in most Parts of Europe, so is seldom admitted into Gardens.

The other 4 Sorts are supposed to be only seminal Va-

riations, but from 40 Years Experience I have never found them vary from one to the other Sort, and I am certain whoever will make the trial, by sowing the Seeds of each carefully without Mixture, will always find the Plants prove the same as the Seeds were saved from.

The 1st Sort here mentioned is that which is commonly cultivated in Kitchen Gardens for its Root, of which there are several Varieties, as the small-topped, the deep red, the pale red or Salmon, and the long-topped striped Radish; all which are Varieties arising from Culture. The small-topped Sort is most commonly preferred by the Gardeners near London, because they require much less Room than those with large Tops, and may be left much closer together, and, as the forward Radishes are what produce the greatest Profit to the Gardener, the large topped Sort being commonly sown upon Borders near Hedges, Walls, or Pales, and apt to grow mostly to a Top, and not swell so much in the Root as the other, especially if left pretty close.

The Seasons for sowing this Seed are various, according to the Time when they are desired for Use, but the earliest Season is commonly toward the latter End of October, that the Gardeners near London sow them to supply the Markets, and these, if they do not miscarry, will be fit for Use in March following, which is full as soon as most People care to eat them. They are commonly sown on warm Borders near Walls, Pales, or Hedges, where they may be defended from the cold Winds; but there are some who sow Radish Seeds among other Crops in the Middle of September, and, if these are not destroyed by Frost, they will be fit for Use soon after Christmas, but they must be eaten while young, for they soon grow sticky and strong.

The 2d Sowing is commonly about Christmas, provided the Season be mild, and the Ground in a fit Condition to work; these are also sowed near Shelter, but not so near Pales and Hedges as the first Sowing. These, if they are not destroyed by Frost, will be fit for Use the Beginning of April, but to have a Succession of these Roots for the Table through the Season, you should sow their Seeds once a Fortnight from the Middle of January till the Beginning of April, always observing to sow the latter Crops on a moist Soil, and an open Situation, otherwise they will run up, and grow sticky, before they are fit for Use.

Many Gardeners near London sow Carrot Seed with their early Radishes, so that, when their Radishes are killed, which often happens, the Carrots will remain, for the Seeds of Carrots commonly lie in the Ground five or six Weeks before they come up, and the Radishes seldom lie above a Fortnight at that Season, so that these are often up, and killed, when the Carrot Seed remains safe in the Ground; but, when both Crops succeed, the Radishes must be drawn off very young, otherwise the Carrots will be drawn up so weak, as not to be able to support themselves when the Radishes are gone.

It is also a constant Practice with these Gardeners to mix Spinach Seed with the latter Crops of Radishes, which when the Radishes are drawn off, and the Ground cleaned between the Spinach, will grow prodigiously, and in a Fortnight's Time as completely cover the Ground, as though there had been no other Crop. And this Spinach, if it be of the broad-leaved Kind, will

1e larger and fairer than it commonly is when sown by itself, because where People have no other Crop mixed with it they commonly sow it too thick, whereby it is drawn up weak, but here the Roots stands pretty far apart, so that after the Radishes are gone, they have full Room to spread, and, if the Soil be good, it is a prodigious Size this Spinach will grow to, before it runs up for Seed; but this Husbandry is chiefly practised by such Gardeners as pay very dear for their Land, and are obliged to have as many Crops in a Year as possible, to pay such large Rents.

When the Radishes are come up, and have got five or six Leaves, they must be pulled up where they are too close, otherwise they will draw up to a Top, but the Roots will not increase their Bulk. In doing this, some only draw them out by Hand, but the best Method is to hoe them with a small Hoe, which will stir the Ground, and destroy the young Weeds, and promote the Growth of the Plants. The Distance which these should be left, if for drawing up small, may be 3 Inches, but, if they are to stand until they are pretty large, 6 Inches is full near enough, and a small Spot of Ground will afford as many Radishes at each Sowing, as can be spent in a Family while they are good.

If you intend to save Seeds of your Radishes, you should, at the Beginning of May, prepare a Spot of Ground in Proportion to the Quantity of Seeds intended (but you should always make Allowance for bad Seasons, because it often happens, in a very dry Season, that there will not be a fourth Part of the Quantity of Seeds upon the same Proportion of Ground as there will be in a moist Season). This Ground should be well dug and levelled; then you should draw up some of the straightest and best-coloured Radishes (throwing away all such as are short, and that branch out in their Roots); these should be planted in Rows 3 Feet Distance, and 2 Feet asunder in the Rows, observing, if the Season be dry, to water them until they have taken Root; after which they will require no farther Care, but to hoe down the Weeds between them until they are advanced so high, as to spread over the Ground, when they will prevent the Growth of Weeds.

When the Seed begins to ripen, you should carefully guard it against the Birds, which will otherwise destroy it. When it is ripe (which you may know by the Pods changing brown), cut it, and spread it in the Sun to dry; after which thresh it out, and lay it up for Use, where the Mice cannot come to it, who will eat it up.

The small round-rooted Radish is not very common in England, but in many Parts of Italy is the only Sort cultivated; the Roots of this Kind are very white, round, small, and very sweet. This may be propagated as the common Sort but only with this difference, viz. That it must not be sown till the Beginning of March, and the Plant allowed a greater Distance. The Seeds of this Kind are very subject to degenerate, when sown in England, unless they are, at such Distance from the common Sort, as that the Farina of one cannot mix with the other.

The other round-rooted Radishes are rarely cultivated in England, but those, who have a Mind to have them, may sow them as the last.

The black and white Spanish Radishes are commonly

cultivated for medicinal Use, though there are some Persons very fond of them for the Table. These are commonly sown about the Middle of July, or a little earlier, and are fit for the Table by the End of August, or Beginning of September, and will continue good till the Frost spoils them. These must be thinned to a greater Distance than the common Sort, for the Roots grow as large as Turnips, therefore should not be left nearer together than 6 Inches.

Some Persons who are very curious to have these Roots in Winter, draw them out of the Ground before the hard Frost comes on, and lay them up in dry Sand as is practised for Carrots, being careful to guard them from Wet and Frost, and by this Method they preserve them till the Spring.

RAPISTRUM. See Sinapis.

RAPUNCULUS. *Tourn. Inst. R. H.* 113. *Tab.* 38. *Phyteuma. Lin. Gen. Pl.* 203. Rampion.

The Characters are,

The Empalement of the Flower is of one Leaf divided into 5 acute Parts sitting upon the Germen. The Flower hath one Petal, which is flurly, spreading open, and cut into 5 linear Segments which are recurved; it hath 5 Stamina, shorter than the Petal, terminated by oblong Summits. The Germen, which is situated under the Flower, supports a slender recurved Style crowned by an oblong, twisted, three pointed Stigma; it afterward becomes a roundish Capsule with three Cells filled with small roundish Seeds.

The Species are,

1. **RAPUNCULUS** *spica oblonga, capsulis bilocularibus, foliis radicalibus cordatis.* Rampion with an oblong Spike of Flowers, Capsules containing two Cells, and the lower Leaves Heart-shaped. *Rapunculus spicatus C. B. P.* 92. Spiked Rampion.

2. **RAPUNCULUS** *fasciculo terminali sessili, foliis dentatis radicalibus cordatis.* Rampion with Flowers growing in Bunches, and terminating the Stalks, indented Leaves, and those at the Bottom Heart-shaped. *Rapunculus Alpinus corniculatus C. B. P.* 93. Horned Alpine Rampion.

3. **RAPUNCULUS** *capitulo subrotundo foliis linearibus integerrimis.* Rampion with roundish Heads, and linear entire Leaves. *Rapunculus folio gramineo. Tourn. Inst.* 113. Rampion with a Grass Leaf.

4. **RAPUNCULUS** *capitulo subsessile, foliis omnibus lanceolatis.* Rampion with Heads somewhat leafy, and all the Leaves Spear-shaped. *Rapunculus Alpinus parvus comosus. J. B.* 2. p. 811. Small Alpine, hairy Rampion.

5. **RAPUNCULUS** *capitulo subrotundo, foliis serratis radicalibus cordatis.* Rampion with roundish Heads, and sawed Leaves, the lower ones Heart-shaped. *Rapunculus flore gloioso, purpureo. J. B.* 2. 810. Rampion with a purple globular Flower.

6. **RAPUNCULUS** *foliis obtusis, spica pauciflora. Hall. Helv.* 497. Rampion with obtuse Leaves, and a Spike containing few Flowers.

These are all hardy Plants which will thrive in the open Air. They are propagated by Seed, which should be sown in Autumn, for if kept out of the Ground till Spring, they frequently fail. These Seeds should be sown on a Bed of fresh undunged Earth, where they are designed to remain, for they do not thrive so well when transplanted; therefore the best Method is to make small Drills cross the Bed about 18 Inches asunder, and sow the

the Seeds therein; then cover them lightly over with Earth, for if they are buried too deep, they will rot in the Ground. The following Spring the Plants will come up, when they should be diligently weeded, which is all the Care they will require, only to be thinned where too close, so as to leave them 6 or 7 Inches apart in the Rows, and afterwards they require no farther attention, but to keep them clear from Weeds. In June the Plants will flower, and, if the Summer proves favourable, will produce ripe Seeds.

As these Plants do not continue above 2 or 3 Years, there should be Seeds sown every other Year to continue the Sorts, for they are Plants which require little Trouble to cultivate, and their Flowers make a pretty Variety in large Gardens, therefore they may be allowed a Place amongst other hardy Flowers.

RAPUNTIIUM. *Tourn. Inst. R. H. 163. Tab. 51. Lobelia. Lin. Gen. P. 897.* Rampions, or Cardinal's Flower.

The Characters are,

The Empalement of the Flower is 1 Leaf cut into 5 linear Segments, the two upper being larger than the other. The Flower is of 1 Petal; it hath a long cylindrical Tube a little curved, and divided at the Brim into 5 Segments, 2 of which compose the upper Lip, and are smaller than the 3 lower which compose the under; it hath 5 Awl-shaped Stamina, the length of the Tube, terminated by oblong Summits which coalesce at the Top in form of a Cylinder, but open in 5 parts at their Base; it has an acute Germen, situated below the Flower, supporting a cylindrical Style crowned by a hairy obtuse Stigma. The Germen afterwards becomes an oval Capsule, opening at the Top, filled with small Seeds.

The Species are,

1. **RAPUNTIIUM caule erecto, foliis lanceolatis serratis, spicâ terminali.** Cardinal's Flower with an erect Stalk, Spear-shaped sawed Leaves, and a Spike of Flowers terminating the Stalk. *Rapuntium maximum, coccineo spicato flore. Col. in Reeb. 880.* The largest Rapuntium with a Spike of scarlet Flowers, commonly called scarlet Cardinal's Flower.

2. **RAPUNTIIUM caule erecto, foliis lineari-lanceolatis integerrimis acuminatis spicâ terminali.** Cardinal's Flower with an erect Stalk, a linear, Spear-shaped entire, acute-pointed Leaf, and a Spike of Flowers terminating the Stalks.

3. **RAPUNTIIUM caule erecto, foliis ovato-lanceolatis crenatis, calycum sinibus reflexis.** Cardinal's Flower with an erect Stalk, oval, Spear-shaped, crenated Leaves, and the Sinuses of the Empalements reflexed. *Rapuntium Americanum, flore dilute cœruleo. H. R. Par. 105.* American Cardinal's Flower, with a pale blue Flower, commonly called, the blue Cardinal's Flower.

4. **RAPUNTIIUM caule erecto, foliis cordatis obsolete dentatis petiolatis, floribus sparsis thyrsis longissima.** Cardinal's Flower with an erect Stalk, Heart-shaped Leaves somewhat indented, and Foot Stalks, and the longest Spike of Flowers placed thinly. *Rapuntium Americanum trachelii folio, flore purpurascens. Plum. Cat. 5.* American Cardinal's Flower with a Throatwort Leaf, and a purplish Flower.

5. **RAPUNTIIUM caule erecto foliis inferioribus subrotundis crenatis, superioribus lanceolatis serratis, spicâ terminali.** Rapuntium with an erect Stalk, the lower Leaves roundish and crenated, the upper Spear-shaped and saw-

ed, and a Spike of Flowers terminating the Stalk. *Rapuntium urens, soloniense H. R. Blas.* Stringing Cardinal's Flower of Blois.

6. **RAPUNTIIUM caule erecto foliis ovatis subserratis, pedunculis longioribus, capsulis inflatis.** Cardinal's Flower with an erect Stalk oval Leaves somewhat sawed and longer than the Foot Stalks, and swelling Seed Vessels. *Lobelia caule erecto brachiato, foliis ovato-lanceolatis obsolete incis, capsulis inflatis. Hort. Cliff. 500.* Lobelia with an erect branched Stalk, oval Spear-shaped Leaves a little cut, and swollen Seed Vessels.

7. **RAPUNTIIUM foliis ovalibus crenatis laxatis floribus lateralibus solitariis.** Cardinal's Flower with oval crenated downy Leaves, and Flowers growing singly from the Sides of the Stalks. *Rapuntium foliis subrotundis hirtis, flore ex alis solitario. Burm. Afr. 105. Tab. 40.* Rapuntium with roundish hairy Leaves, and solitary Flowers proceeding from their Wings.

8. **RAPUNTIIUM foliis lanceolatis dentatis, pedunculis brevissimis lateralibus tubo corollæ longissimo.** Cardinal's Flower with Spear-shaped indented Leaves, very short Foot Stalks to the Flowers which proceed from the Sides of the Stalks, and a very long Tube to the Petal. *Rapunculus aquaticus, foliis cicorii flore albo tubo longissimo. Sloan. Hist. Jam. 1. p. 158.* Aquatick Rampion with a Cicory Leaf, and a white Flower having the longest Tube.

9. **RAPUNTIIUM caule patulo ramoso foliis lanceolatis subdentatis, pedunculis longissimis.** Rapuntium with a spreading branching Stalk, Spear-shaped Leaves somewhat indented, and very long Foot Stalks to the Flowers. *Campanula minor Africana, erini facie, flore violaceo, caulibus erectis H. L. 110.* Smaller African Bell Flower with the Appearance of *Erinus*, a Violet Flower, and an upright Stalk.

10. **RAPUNTIIUM caulibus procumbentibus, foliis lanceolatis serratis, pedunculis lateralibus.** Cardinal's Flower with trailing Stalks, Spear-shaped sawed Leaves, and Foot Stalks proceeding from their Sides. *Campanula minor Africana, erini facie caulibus procumbentibus. H. L. 108.* Smaller African Bell Flower with the Appearance of *Erinus* and trailing Stalks.

The 1st Sort grows naturally by the Side of Rivers and Ditches in great Part of North America, but has been many Years cultivated in the European Gardens, for the great beauty of its scarlet Flowers. The Root is composed of many white fleshy Fibres; the lower Leaves are oblong, a little sawed and of a dark purplish Colour on their upper Side; the Stalks are erect, and rise about a Foot and a Half high; they are garnished with Spear-shaped Leaves about 3 Inches long, and one and a Half broad in the Middle, a little sawed on their Edges, having very short Foot Stalks, and are placed alternately; the Stalk is terminated by a spike of Flowers of an exceeding beautiful scarlet Colour; these have a pretty long Tube, a little incurved, but, at the Top cut longitudinally into 5 Segments; the upper, which are the smallest, are greatly reflexed, the three under, which form the lower Lip, are larger, and spread open. These appear the latter End of July, and in August when they make a fine Appearance for a Month or more, and when the Autumn proves favourable, they will produce good Seeds here.

This is propagated by Seeds, which, when they ripen in

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in *England*, should be sown in Autumn in Pots filled with rich Kitchen Garden Earth, and placed under a common hot Bed Frame; or if the Seeds come from the Country, where the Plants grow naturally, they should be sown the same Way, so soon as they arrive, for if kept out of the Ground 'till Spring, they will lie a Year in the Ground before they vegetate. The Pots, in which these Seeds are sown, should be exposed to the open Air when the Weather is mild, but they must be screened from the Frost, and the very hard Rains in Winter. In Spring the Plants will appear, when they should have as much free Air as possible in mild Weather, and, if the Spring proves dry, they must be frequently refreshed with Water. As soon as they are fit to remove, they should be each planted in a separate small Pot filled with the same rich Earth, and placed in the Shade, till they have taken new Root; then they may be placed where they may have the Morning Sun, in which Situation they may remain till Autumn. During the Summer they must be duly watered in dry Weather, and, when the Roots have filled the Pots, they should be removed into larger. In Autumn they must be placed under a common Frame to screen them from hard Frost, but they should enjoy the open Air at all Times, when the Weather is mild. The Spring following they should be new-potted, and placed where they may have the Morning Sun, always observing to water them duly in dry Weather, which will cause their Stalks to be stronger, and produce larger Spikes of Flowers in *August*; these will continue long in Beauty, if not too much exposed to the Sun, and, if the Autumn proves warm, the Seeds will ripen well in *England*. The Roots of this Plant will sometimes last 2 or 3 Years, and produce Offsets for Increase, but they will not flower so strong as the seedling Plants, therefore an annual Supply of them should be raised. There are many who propagate this Plant by cutting their Stalks into proper Lengths, and plant them in Pots filled with good Earth, or into an East Border, covering them close with Glasses. These frequently take Root, so produce young Plants, but they are not so good as the seedlings.

The Plants of this Sort will live in the full Ground, if protected from hard Frost in Winter. and will flower stronger than those in Pots.

The 2d Sort grows naturally at *Campeachy*, from whence the late Mr. *Robert Millar* sent the Seeds; this hath a Fibrous Root like the first. The Stalks are much larger, and rise a Foot higher; they are closely garnished with Leaves above 4 Inches long, and half an Inch broad, very smooth and entire, ending in acute Points; they are terminated by short Spikes of Flowers larger than those of the 1st Sort, but of the same beautiful scarlet Colour, and which appear about the same Time with them.

This is propagated by Seeds as the first, but the Plants are not so hardy, therefore require to be placed in a moderate Stove in Winter, and in Summer in a deep Frame, where they may be covered with Glasses in bad Weather, but enjoy the free Air at all Times, when the Weather is favourable. With this Management the Plants flowered very well in the *Chelsea* Garden, but they did not perfect Seeds.

The 3d Sort grows naturally in *Virginia*, but has

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been long an Inhabitant of the *English* Gardens; this hath a perennial fibrous Root. The Leaves are smooth, oval, Spear-shaped, and a little indented on their Edges; the Stalks rise a Foot and a Half high, and are garnished with Leaves like those at the Bottom, which are gradually smaller to the Top, sitting close to the Stalk. The Flowers come out from the Wings of the Leaves; they are of a pale blue Colour, and have large Empalements, whose Edges are reflexed; they appear a little earlier in *July* than the first Sort, and the Seeds frequently ripen in *England*.

It is propagated as the first Sort, and the Plants require the same Culture.

The 4th Sort grows naturally in *Jamaica*, from whence the late Dr. *Houssoun* sent the Seeds; this is an annual Plant. The Stalk rises about a Foot high, then divides into 4 or 5 smaller, which grow erect. The lower Part is garnished with Heart-shaped smooth Leaves, about an Inch and a Half long, and three Quarters of an Inch broad at the Base, lessening to a Point at the End; they have small Indentures on their Borders, and stand upon short Foot Stalks. The upper slender Stalks are thinly garnished with small purplish Flowers to the Top, and these are succeeded by small Seed Vessels, which ripen in Autumn. When the Seeds are permitted to scatter on the Pots which stand near them, and are sheltered from the Frost, the Plants will come up plentifully the following Spring, or, if they are sown in Pots in Autumn, and sheltered in Winter, they will arise the following Spring, and these should be transplanted into separate small Pots, placing them under a Frame, where they will flower in *June* and *July*, and their Seeds ripen in *September*; the Plants will then decay.

The 5th Sort grows naturally in the Forests about *Blois* in *France*; this is an annual Plant. The Root is composed of many fleshy Fibres; the Stalk rises about 2 Feet high, and is garnished with Spear-shaped Leaves near 3 Inches long, and one broad in the Middle; they are very thin, and sawed on their Edges, sitting close to the Stalk; the upper Part of the Stalk is garnished with very small Leaves, and from their Base arise the Flowers which are of a bright blue Colour. They appear in *July*, and are succeeded by roundish Seed Vessels, with Holes at the Top, filled with small red Seeds.

The Seeds of this Plant should be sown in Autumn in Pots filled with loamy Earth, and placed under a hot Bed Frame in Winter. When they come up in Spring, they should be transplanted either into a Border of soft loamy Earth or into separate Pots, shading them till they have taken new Root; afterward they must be duly watered in dry Weather, which will cause them to flower strong, and produce good Seeds.

The 6th Sort grows naturally in *North America*; this is a biennial Plant in *England*, which rarely flowers the same Year the Plants come up, but decays soon after the Seeds are ripe. The Stalks of this are channeled and hairy, they grow erect to the Height of 2 Feet, and are garnished with thin oval Leaves, about 2 Inches long, and one broad in the Middle, sitting close to the Stalk; they are of a light green, a little sawed on the Edges. The Flowers stand upon long slender Foot Stalks, which come out from the Wings of the Leaves, and form a loose Spike which terminate the Stalk; they

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are small, and of a light blue Colour. This flower in July, and the Seeds ripen in September. This is propagated by Seeds, which should be sown in Autumn, in Pots filled with rich Earth, and treated as the 1st Sort.

The 7th Sort grows naturally at the *Cape of Good Hope*; this is biennial; the Stalks rise a Foot and a Half high, they are covered with a hairy Down, and are purplish toward the Bottom; the Leaves are oval, 2 Inches and a Half long, and an Inch and a Quarter broad, of a deep green, a little hairy on their under Side, and sit close to the Stalks. The Flowers stand on long slender Foot Stalks, which come out from the Bosom of the Leaves, sometimes one proceeding from a Joint, and at others they come out opposite on each Side the Stalk, each Foot Stalk sustaining one pale blue Flower, which being small makes but little Appearance. This flowers about the same Time with the former, and may be propagated the same Way.

The 8th Sort grows naturally in moist Places, on most of the Islands of the *West Indies*. This is also a biennial Plant, whose Root is composed of a few strong ligneous Fibres, which strike deep in the Ground; the Stalk rises about 8 or 9 Inches high, and is closely garnished with Leaves on every Side; these are 4 Inches long and half an Inch broad, very deeply indented on their Edges; they are hairy, of a deep green; and sit close to the Stalks. The Flowers come out at every Joint from the Wings of the Leaves, standing on very short Foot Stalks; the Tube of the Flower is from 3 to 4 Inches long, very slender, and deeply cut at the Top into 5 Segments, which spread open; they are white and appear in June, and are succeeded by turgid Seed Vessels, crowned by the 5 Segments of the Petal, having 3 Holes at the Top, and filled with small grayish Seeds. The Seed should be sown soon after it is ripe, in Pots filled with rich Earth, and plunged into the Tan Bed in the Stove, observing to refresh the Earth frequently with Water. In Spring the Pots may be removed, and plunged into a hot Bed, which will soon bring up the Plants; when these are fit to remove, they should be each transplanted into a separate small Pot, filled with rich Earth, and plunged into a fresh hot Bed, shading them from the Sun till they have taken new Root; then they may be treated as other tender Plants from the same Country, giving them a large Share of Air in warm Weather, and frequently refreshing them with Water. In Autumn the Plants must be plunged into the Tan Bed of the Stove, where they will flower the following Summer and produce ripe Seeds, soon after which the Plants will decay. If the Seeds of this Plant are brought from the *West-Indies*, they should be sown as soon as they arrive, in Pots filled with rich Earth; and if it happens in Winter, the Pots should be plunged into the Tan Bed in the Stove; but if in Spring or Summer, they may be plunged into a hot Bed in the common Frames. These Seeds when sown in the Spring, seldom grow the same Year, therefore the following Autumn the Pots should be removed into the Stove, and managed according to the above Directions.

The 9th Sort grows naturally at the *Cape of Good Hope*; this is an annual Plant; the Stalks are slender,

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branching, and spread out on every Side; they rise about a Foot high, and are garnished with small Spear-shaped Leaves, which are indented on their Edges, and sit close to the Branches. The Flowers are small and blue, they stand upon very slender long Foot Stalks, and appear in July; they are succeeded by small roundish Seed Vessels, filled with small Seeds which ripen in September. If the Seeds of this Sort are sown in Autumn, they will succeed much better than when sown in Spring; they may be sown in Pots, and sheltered under a common hot Bed Frame in Winter, exposing them to the open Air at all Times in mild Weather, but screening them from the Frost; and in Spring, the Pots should be plunged into a moderate hot Bed, which will soon bring up the Plants; when they are fit to remove, they should be each planted in a separate small Pot filled with rich Earth, and plunged into a moderate hot Bed again, shading them from the Sun till they have taken new Root; then they must have a large Share of free Air when the Weather is mild; and as the Plants grow strong, they should be gradually hardened to bear the open Air, into which they should be removed in June, placing them in a sheltered Situation, where they will flower in July, and if the Season proves favourable, the Seeds will ripen in September; but if the Season prove cold, it will be proper to remove one or two Plants into a Glase Case, to obtain good Seeds.

The 10th Sort comes from the *Cape of Good Hope*; this hath trailing Stalks, the Leaves are sawed on their Edges, and the Foot Stalks come out from the Side of the Branches, in which it differs from the last Sort. It may be propagated by Seeds, and treated as the last.

RAUVOLFIA. *Plum. Nov. Gen. 19. Tab. 40. Lin. Gen. Pl. 259.*

The Characters are,

The Flower has a small permanent Empalement of one Leaf, cut into 5 Parts at the Top. The Petal is Funnel-shaped, the Tube cylindrical and globular at the Base, and cut at the Brim into 5 Parts. It has 5 Stamina a little shorter than the Tube, terminated by erect Summits, and a roundish Germen, supporting a short Style, crowned by a beaded Stigma. The Germen becomes a globular Berry with two Cells, inclosing one compressed Seed in each.

The Species are,

1. **RAUVOLFIA** *foliis quaternis, ovato-lanceolatis, subdentatis.* *Rauvolfia* with Leaves placed by Fours, which are oval, Spear-shaped, and somewhat indented. *Rauvolfia tetraphylla latifolia.* *Plum. Nov. Gen. 19.* Broad four-leaved *Rauvolfia*.

2. **RAUVOLFIA** *foliis quaternis lanceolatis integerrimis.* *Rauvolfia* with four Spear-shaped entire Leaves at each Joint. This is the *Rauvolfia tetraphylla angustifolia.* *Plum. Nov. Gen. 19.* Narrow four-leaved *Rauvolfia*.

Both these Sorts grow naturally in the warmest Parts of America; Mr. Robert Millar sent the Seeds from Carthage in New-Spain, where he observed the Shrubs growing in great Plenty. These rise with several ligneous Stalks from the Root, which grow 7 or 8 Feet high, sending out a few small Side Branches, covered with a smooth green Bark when young, but as they are older, their Bark changes to a gray. The Leaves are placed by Fours at each Joint round the Branches; there

those of the first Sort are two Inches and a Half long, and an Inch and a Half broad in the Middle; they are of a light green, and have a few slight Indentures on their Edges; the Leaves of the other Sort are full as long, but are a third Part narrower, and of a thinner Substance. These Differences continue in the Plants which are raised from Seeds, for I have several Times propagated them both from Seeds, and have constantly found the Seeds produce the same as the Plants from which they were taken. The Flowers are produced on slender Foot Stalks, which arise from the Wings of the Leaves; they are tubulous, and globular at their Base, and are succeeded by roundish Berries, about the Size of those of the Privet, which turn black when they are ripe. These Plants flower most part of Summer, and the Fruit ripens in Autumn and Winter; the Leaves and Stalks of these Plants have a milky Juice, which flows out if they are broken.

These Plants are propagated by Seeds, which should be sown in Autumn soon after they are ripe; for if kept out of the Ground 'till Spring, the Plants rarely come up the same Year; and this is frequently the Case with those Seeds, which are brought to England.

The Seeds of these Plants should be sown in Pots filled with fresh Earth, and plunged into a hot Bed of Tanners Bark; for as they are very hard, they frequently remain a long Time in the Ground; therefore when they are in Pots, they may be shifted from one Bed to another, as their Heat decays. When they come up, they must be frequently watered but it must not be given them in large Quantities; for as the Plants are succulent and full of a milky Juice, they are in Danger of rotting with too much Moisture. They should also have a large Share of fresh Air admitted to them in warm Weather, and when about two Inches high, they should be transplanted each into a separate small Pot filled with fresh light Earth, and plunged into the hot Bed again, observing to shade them from the Sun until they have taken new Root; after which Time they should have free Air admitted to them every Day, in Proportion to the Warmth of the Season. In this hot Bed the Plants may remain till toward Michaelmas when they should be removed into the Stove, and plunged into the Tanners Bark, where they must be kept warm, and not have too much Moisture in cold Weather.

As they are Natives of very hot Countries, they will not live in the open Air in England, therefore they should constantly remain in the Stove; and if they are continued in the Bark Bed, they will thrive much faster than when placed on Stands in a dry Stove. But in the Summer Season they should have a large Share of fresh Air admitted to them, and the Leaves of the Plants must be now and then washed with a Sponge, to clear them from the Filth they are apt to contract; which, if suffered to remain, will retard their Growth. Where due Care is taken of them, they will thrive very fast, and the second Year will produce Flowers, and continue so to do for many Years, and will perfect their Seeds in England. They may also be propagated by Cuttings, which should be laid to dry for two or three Days before they are planted, and then plunged into a moderate hot Bed of Tanners Bark, observing to shade

them until they have taken Root, after which they may be treated as the seedling Plants.

RESEDA. Tourn. Inst. R. H. 423. Tab. 238. Lin. Gen. Pl. 535. Bastard-rocket.

The Characters are,

The Empalement of the Flower is of one Leaf, cut into several Parts almost to the Bottom, and is permanent. The Petals of the Flower are unequal, and generally trifid, and have a Honey Gland on their Base, the Length of the Empalement. The Honey Glands are plain, erect, and produced from the upper Side of the Receptacle, between the Stamina and the Place of the upper Petal, joining with the Base of the Petals, dilating from the Sides. It hath 15 or 16 short Stamina, terminated by erect obtuse Summits; and a gibbous Germen, sitting upon very short Styles, crowned by a single Stigma. The Germen after ward becomes a gibbous angular Capsule of one Cell, with an Aperture between the Styles, filled with Kidney-shaped Seeds fastened to the Angles of the Capsule.

The Species are,

1. RESEDA foliis pinnatis, foliolis integris alternis floribus tetragynis. Bastard-rocket with winged Leaves, whose Lobes are entire and placed alternate, and have four Styles to the Flower. *Reseda vulgaris*. C. B. P. 100. Common Bastard-rocket.

2. RESEDA foliis omnibus trifidis, inferioribus pinnatis. Hort. Cliff. 213. Bastard-rocket with all the Leaves trifid, and the lower ones winged. *Reseda crispa* Gallica. Bocc. Sic. 77. French curled Bastard-rocket.

3. RESEDA foliis integris trilobisque, calycibus maximis. Hort. Cliff. 412. Bastard-rocket with entire and trifid Leaves, and having the largest Empalement. *Reseda minor vulgaris*. Tourn. Inst. 413. Lesser common Bastard-rocket.

4. RESEDA foliis difformibus, dentatis floribus trigynis. Bastard-rocket with difformed indented Leaves, and Flowers having three Styles. *Reseda minor alba, dentatis foliis*. Barrel. Icon. 588. Smaller white Bastard-rocket with indented Leaves.

5. RESEDA foliis pinnatis, floribus tetragynis. Hort. Upsal. 149. Bastard-rocket with winged Leaves and Flowers having four Styles. *Reseda foliis calcitrapae flore albo*. Mor. Hort. R. Bl. Bastard-rocket with Star Thistle Leaves and a white Flower.

6. RESEDA foliis integris trilobisque, floribus tetragynis. Tab. 217. Bastard-rocket with entire and three-lobed Leaves, and Flowers having four Styles, commonly called sweet *Reseda*, or *Mignonette d'Egypte*.

7. RESEDA foliis subulatis sparsis. Sauv. Monsp. 41. Bastard-rocket with Awl-shaped Leaves placed thinly. *Sesamoides flore albo, foliis canescentibus*. Tourn. Inst. 424. Bastard *Sesamum* with a white Flower and hoary Leaves.

8. RESEDA foliis lanceolatis integris, calycibus quadrifidis. Lin. Sp. Plant. 448. Bastard-rocket with Spear-shaped entire Leaves, and quadrifid Empalements. *Luteola herba falicis folio*. C. B. P. 100. Dyer's Weed, or wild Woad, by some called Weld.

The 1st Sort grows naturally in the South of France, Italy, and Spain. This is a biennial Plant, which flowers and seeds the second Year, and perishes soon after. The Root is long, white, and a little ligneous; the Leaves are unequally winged and entire, the Stalks channelled

nelled, and garnished with smaller winged Leaves; they rise a Foot and a Half high, and are terminated by a long loose Spike of pale yellow Flowers, composed of several unequal Petals; the two upper are the largest, the Side ones less, and the lower are so small, as to be scarce conspicuous; they are all of a singular Figure, and appear as if one Leaf came out of two others. In the Middle are situated many Stamina terminated by yellow Summits, and at the Bottom a three cornered Germen, which afterward turns to a three-cornered Seed Vessel, having three or four Holes at the Top, and filled with black Seeds.

The 2d Sort grows naturally in chalky Land, in many Parts of *England*; the lower Leaves of this are winged, and every Lobe is cut into three smaller; they are curled on their Edges, and have some small Indentures. The Stalks rise about the same Height as the former, and are terminated by longer and looser Spikes of Flowers, than those of the former Sort; the Flowers are paler, and approach to a white. This flowers in *June*, and the Seeds ripen in *September*.

The 3d Sort grows naturally in the South of *France* and *Italy*; this is an annual Plant, which has generally a single fleshy Tap Root, running deep in the Ground, sending out several trailing Stalks near a Foot long, which divide into smaller Branches; these are garnished with small Leaves, some Wedge-shaped and entire, others cut into three obtuse Parts. The Ends of the Branches are terminated by loose Spikes of Flowers, standing on pretty long Foot Stalks. The Empalement of the Flower is large, divided into 5 Segments almost to the Bottom; the Flowers are white, and shaped like those of the other Sorts. It flowers in *July*, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in *Italy* and *Spain*; this is a biennial Plant, the lower Leaves are unequally winged, some of the intermediate Lobes or Segments being much less than the others, and of different Shapes. The Stalk rises a Foot and a Half high, garnished with smaller disformed winged Leaves, indented on their Edges. The Flowers are produced in slender loose Spikes at the Top of the Stalks; they are small and white, of the same Shape with the others, appearing in *June*, and the Seeds ripen in *September*.

The 5th Sort grows naturally in the South of *France*; it is a biennial Plant, the lower Leaves are large, winged, and composed of many narrow Lobes or Segments placed alternate, of a grayish Colour; the Stalks rise two Feet and a Half high, and are garnished with the like Leaves, which diminish to the Top; the Stalks are terminated by shorter and thicker Spikes of Flowers than either of the former, which are white, and shaped like those of the other Species. It flowers in *June*, and the Seeds ripen in *August*.

The 6th Sort is supposed to grow naturally in *Egypt*; the Seeds were sent me by Dr. *Adrian Van Royen*, the late Professor of Botany at *Leyden*. The Root of this Plant is composed of many strong Fibres, which run deep in the Ground, from which come out several Stalks about a Foot long, which divide into many small Branches; these are garnished with oblong Leaves, some entire, and others divided into three Parts; they are about two Inches long, and three Quarters of an Inch broad

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in the Middle, ending in oval Points; they are of a deep green Colour. The Flowers are produced in loose Spikes at the End of the Branches, they stand on pretty long Foot Stalks, and have large Empalements; they are of an herbaceous white Colour, and smell very like fresh Raspberries, which occasions its being much cultivated in the *English* Gardens. This Plant is so like the 3d Sort, as to be taken for it by some, but the Flowers of the 3d have no Scent; so that those who have been imposed on, by having the Seeds of the 3d Sort sent them for this, have supposed the Plant was degenerated.

The 7th Sort grows naturally on the Mountains in *Spain*; this hath a perennial Root, from which arise a few slender ligneous Stalks, a Foot and a Half high, thinly garnished with linear obtuse Leaves, of a grayish Colour; the upper Part of the Stalk is garnished for a good Length with small, whitish, purple Flowers, ranged in a very loose Spike, sitting close to the Stalk. These appear the latter End of *May*, and the Seeds ripen in *August*.

The 8th Sort grows naturally on dry Banks and old Walls in *England*, but is cultivated in some Places for the Dyer's Use. This is now generally believed to be the Plant, with which the ancient Inhabitants of this Island painted themselves, and not the Woad, as has been by some supposed; for the Dyer's Weed is a Native here, whereas the Woad has been since introduced into this Country. This is a biennial Plant; the Root is composed of a few ligneous Fibres; the Leaves are 4 Inches long, and half an Inch broad, entire, and ending in obtuse Points; these the first Year spread circularly near the Ground, and have some gentle Wayings on their Edges; the Stalks rise 3 Feet high, and are garnished with Leaves of the same Shape with those at Bottom. They are terminated by long loose Spikes of yellowish Flowers, which appear the latter End of *June*, and the Seeds ripen in *September*.

The five Sorts first mentioned, and also the 7th, are seldom cultivated in Gardens, except for Variety, having very little Beauty and being of no Use; but whoever has a Mind to have them, need only sow the Seeds in Autumn, and when the Plants come up, thin them and keep them clean from Weeds. If their Seeds are permitted to scatter, the Plants will come up in Plenty, and sometimes become troublesome Weeds.

The Seeds of the 6th Sort should be sown on a moderate hot Bed in *March*, and when the Plants are strong enough to transplant, they should be pricked out upon another moderate hot Bed to bring them forward; but they should have a large Share of Air in warm Weather, otherwise they will draw up very weak. About the latter End of *May* they may be planted out, some into Pots, to place near the Apartments, and others into warm Borders, where they may remain to flower and Seed. For the Plants which grow in the full Ground, often produce more Seeds than those in Pots; but at the Time when the Seed Vessels begin to swell, the Plants are frequently infested with green Caterpillars, which, if not destroyed, will eat off all the Seed Vessels.

If the Seeds of this Plant are sown on a Bed of light Earth in *April*, the Plants will come up very well, and when not transplanted, will grow larger than those raised

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fed in the hot Bed, but they will not flower so early. The Plants may be preserved through the Winter in a Green-house, where they will continue flowering most Part of the Year, but the 2d Year they are not so vigorous as the first.

The 8th Sort is the Weld, which is accounted a rich Commodity for Dyeing; where this is cultivated, the Seeds are commonly sown with Barley in the Spring, and after the Barley is taken off the Ground, the Weld begins to make some Progress, and the next Season is pulled up for Use. This has been long practised, and it will be difficult to prevail on the Cultivators of this Plant to depart from their old Customs; but if any Persons will follow the Directions hereafter given, I can from Experience promise them much better Successes.

The Weld will grow upon very poor Soil, but the Crop will be in proportion to the goodness of the Land; for upon very poor Ground, the Plants will not rise a Foot high, whereas on good Ground I have measured them upward of 3 Feet, and the Stalks, Leaves, &c. have been in proportion; so that the better the Soil is, the greater will be the Produce.

The best Way to cultivate this Plant, is to sow it without any other Crop; if the Ground is ready by the Beginning or Middle of *August*, that will be a good Season; the Land should be well ploughed and harrowed fine, but unless very poor, will not require Dung; when the Ground is well harrowed and made fine, the Seeds should be sown; one Gallon of the Seeds is sufficient to sow an Acre of Land, for they are small. If Rain falls in a little Time after the Seeds are sown, it will bring up the Plants, and in two Months they will be so far advanced, as to be easily distinguished from the Weeds; then they should be hoed in the like Manner as Turnips, always observing to do it in dry Weather, for then the Weeds will soon die after they are cut up; at this Time the Plants may be left about six Inches Distance; if this is done in dry Weather, and the Work well performed, the Plants will be clean from Weeds till the Spring; but as young Weeds will come up in *March*, so if in dry Weather the Ground is hoed again, it may be performed at a small Expence while the Weeds are young, and then they will soon decay; and if after this there should many more Weeds appear, it will be proper to hoe it a third Time, about the Beginning of *May*, which will preserve the Ground clean till the Weld is fit to pull. The best time to pull the Weld for Use, is as soon as it begins to flower, though most People stay till the Seeds are ripe, being unwilling to lose the Seeds; but it is much better to sow a small Piece of Land with this Seed, to remain for a Produce of new Seeds, than to let the whole stand for Seed; because the Plants which are permitted to stand so long will be much less worth for Use, than the Value of the Seeds; besides, by drawing off the Crop early, the Ground may be sown with Wheat the same Season; for the Plants may be drawn up the latter End of *June*, when they will be in the greatest Vigour, so will afford a greater Quantity of the Dye.

When the Plants are pulled, they may be set up in small Handfuls to dry in the Field, and when it is dry enough, it may be tied up in Bundles and housed dry,

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being careful to stack it loosely, that the Air may pass between to prevent its fermenting.

That which is left for Seeds should be pulled as soon as the Seeds are ripe and set up to dry, and then beat out for Use; for if the Plants are left too long, the Seeds will scatter. The usual Price of the Seed is ten Shillings a Bushel.

RHABARBARUM. See Rheum.

RHABARBARUM MONACHORUM. See Rumex.

RHAGADIOLUS. See Lapfana.

RHAMNOIDES. See Hippophae.

RHAMNUS. Tourn. Infl. R. H. 593. Tab. 366. Lin. Gen. Pl. 235. the Buckthorn; in French, *Nerprun*.

The Characters are,

It hath male and female Flowers on different Plants; these have no Empalements according to some, or Petals according to others. The Cover of the Sexes is Funnel-shaped, and cut into 4 Parts at the Top, which spread open. The male Flowers have 4 Stamina the Length of the Tube, terminated by small Summits. The female Flowers have a roundish Germen supporting a short Style, crowned by a quadrifid Stigma. The Germen afterward becomes a roundish Berrie, inclosing 4 hard Seeds.

The Species are,

1. RHAMNUS floribus axillaribus, foliis ovato-lanceolatis serratis nervosis, Buckthorn with Flowers proceeding from the Sides of the Branches, and oval, Spear-shaped, sawed, veined Leaves. *Rhamnus catharticus*. C. B. P. 478. Purging or common Buckthorn.

2. RHAMNUS floribus axillaribus, foliis ovatis acuminate nervosis integerrimis. Buckthorn with Flowers proceeding from the Sides of the Branches, and oval, acute-pointed entire Leaves, having Veins. *Rhamnus catharticus minor*. C. B. P. 478. Smaller purging Buckthorn, commonly called Dwarf *Rhamnus*.

3. RHAMNUS foliis lanceolatis, floribus axillaribus. Buckthorn with Spear-shaped Leaves, and Flowers growing from the Sides of the Stalks. *Rhamnus catharticus minor, folio longiori*. Tourn. Infl. 593. Smaller purging Buckthorn with a longer Leaf.

4. RHAMNUS foliis cuneiformibus confertis perennantibus, floribus corymbosis alaribus. Buckthorn with Wedge-shaped ever-green Leaves growing in Clusters, and Flowers growing in roundish Bunches from the Sides of the Branches. *Rhamnus Afer, folio pruni longiore subrotundo, flore candicante, spinis longissimis*. Boerb. Ind. alt. 212. African Buckthorn with a longer roundish Plum Leaf, a very white Flower, and long Spines.

The 1st Sort grows naturally in the Hedges in many Parts of England; it rises with a strong woody Stalk to the Height of 12 or 14 Feet, sending out many irregular Branches; the young Shoots have a smooth, grayish, brown Bark, but the older Branches have a darker and rougher Bark, and are armed with a few short Thorns. The Leaves stand upon pretty long slender Foot Stalks; they are of the oval Spear Shape, about two Inches and a Half long, and one and Quarter broad slightly sawed on their Edges, of a dark green on their upper Side, but of a pale or light green on their under, having a pretty strong Mid-rib, and several Veins proceeding from it, which diverge toward the Sides, but meet

meet again near the Point of the Leaf. The Flowers come out in Clusters from the Side of the Branches; those of the male have as many Stamina, as there are Divisions in the Petal; those of the female have a roundish Germen, which afterward turns a pulpy Berry of a roundish Form, inclosing four hard Seeds. It flowers in June, and the Berries ripen in Autumn.

The Berries of this are used in Medicine; from them there is a purging Syrup made, called *Syrupus à spina cervina*, or Syrup of Buckthorn; which is reckoned a good Medicine to purge watery Humours, and against the Dropsy, Jaundice, Itch, and all Manner of Eruptions on the Skin: Of late Years, the People who supply the Market with these Berries, have mixed several other Sorts with them, so that when the Syrup is made by Persons who have not Skill to distinguish the Berries, it is often very bad, so that two Ounces of the Syrup from one Shop, will not purge so well as one from another; which has brought this Medicine into Disrepute with many Persons. These Berries may be easily known by examining their Seeds, to see if there are four in each, and also by rubbing the Juice upon white Paper, which it will stain of a green Colour.

From the Juice of these Berries is made a very fine green Colour, called by the French *Verd-de-veau*, which is much esteemed by the Painters in Miniature.

The second Sort grows naturally in the South of France; this is an humble Shrub, seldom rising more than 3 or 4 Feet high, sending out many irregular Branches, covered with a dark brown Bark, and garnished with oval Leaves ending in acute Points; they are about three Quarters of an Inch long, and half an Inch broad in the widest Part, which is near the Base; they are of a yellowish green and a thin Consistence, having several Veins diverging from the Mid-rib toward the Sides, which converge again toward the Point. The Flowers come out upon small Curfons or Spurs on the Side of the Branches, each standing upon a separate short Foot Stalk; they are of a yellowish herbaceous Colour having short swelling Tubes, and are cut into 5 acute Segments at the Top, which spread open; they appear in June, but are not succeeded by Berries here.

Mr. Du Hamel de Monceaux, of the Royal Academy of Sciences at Paris, says, that the Fruit of this Species gathered green is the *Grain d'Avignon*, or *Avignon* Berries, which are used in dyeing of yellow, but I have been assured by a Gentleman of Skill who resided long in the South of France, that the *Avignon* Berries were the Fruit of the narrow-leaved *Alaternus*, and in order to be better satisfied of the Truth, I gathered a Quantity of the Berries of the narrow-leaved *Alaternus* before they were full ripe, and carried them to two eminent Dealers in this Commodity, and asked them if they knew what these Berries were; they both assured me, after making Trial of them, that they were *Avignon* Berries, and if I had a large Quantity of them, they would purchase them all; therefore, as the *Alaternus* before mentioned is one of the most common Shrubs in the South of France, from whence the *Avignon* Berries are brought, we may Suppose Mr. Du Hamel has been ill informed.

The 3d Sort grows naturally in Spain and Italy; this

grows to a larger Size than the 2d, but not so high as the 1st. The Branches are stronger, and are armed with a few long Spines; the Leaves are like those of the wild Plum, but are a little longer and narrower; the Flowers are small, of a yellowish Colour, and are produced from the Side of the Branches; these appear in June, but are not succeeded by Berries in this Country.

The first Sort is so common in the Hedges in many Parts of England, that it is seldom cultivated in Gardens; this rises easily from Seeds, sown in Autumn sown after the Berries are ripe, but, if they are kept out of the Ground till Spring, the Plants will not come up till the Year after; they will require no particular Treatment, but may be managed as young Crabs, or any other hardy deciduous Tree; it may also be propagated by Cuttings or Layers. If the young Shoots are laid in Autumn, they will put out Roots by the following Autumn, when they may be taken off from the Plants, and either planted in a Nursery to remain there to get Strength for a Year or two, or they may be planted where they are designed to remain. This is not so proper for Hedges as the Hawthorn or Crab, so those should be preferred to it.

The two other Sorts are preserved in Botanick Gardens for Variety, but, as they are not beautiful, few Persons cultivate them. As these do not produce Fruit in England, they are propagated either by laying down the young Branches in Autumn, or by planting the Cuttings in the Spring, before the Buds begin to swell. These will put out Roots as the common Sort, and may be treated the same Way, for they are both hardy Plants, and will thrive in the open Air.

The 4th Sort grows naturally at the Cape of Good Hope, so is too tender to thrive in the open Air in England, but if placed in a common Green-house with Myrtles, Olives, and the hardier Kinds of exotics in Winter, and removed to the open Air in Summer, it will thrive very well. This rises with a shrubby Stalk to the Height of 4 or 5 Feet, sending out many Side Branches, which, when young, are covered with a green Bark, but, as they advance, the Bark changes to a dark brown; they are armed with a few long slender Thorns, and garnished with Wedge-shaped Leaves, which come out in Clusters at each Joint, 4, 5 or, 6 rising from the same Point, which differ in Size, the largest being about an Inch long, and three Quarters broad, and the smallest about half as large; they are of a deep green, and continue all the Year; their Points are broadened and rounded, growing narrower to their Base, sitting close to the Branches. The Flowers are produced on the Side of the Branches at each Joint; they are collected into roundish Bunches standing on Foot Stalks an Inch long; they are white, and have short Tubes; their upper Part is cut into 5 acute Segments, which spread open in Form of a Star. These appear in June, at which Time the whole Shrub seems covered with Flowers, so as to make a fine Appearance, and, as the Leaves continue green all the Year, it deserves a Place where there is a Conveniency to shelter them in Winter.

This Sort has not as yet produced Seeds in England, but it may be easily propagated by Cuttings, which should

should be planted in Pots filled with loamy Earth the Beginning of April. The Pots should be plunged into a moderate hot Bed, and the Cuttings, shaded from the Sun in the Heat of the Day; they must also be sprinkled with Water two or three Times a Week, as the Earth in the Pots dries, but must by no Means have too much Wet. These Cuttings will put out Roots in about six Weeks, and soon after begin to make Shoots at the Top, then they must have a large Share of Air admitted to them, and be gradually inured to the open Air into which they should be soon after removed, and, when they are well hardened, they may be shaken out of the Pots, and separated being careful to preserve a Ball of Earth to each, and plant them into single Pots filled with soft loamy Earth, placing them in the Shade till they have taken new Root; then they may be removed into a sheltered Situation, where they may remain till the Frost comes on in Autumn, at which Time they must be housed, and treated as the other hardier Kinds of Green-house Plants.

RHEUM. Lin. Gen. Pl. 454. *Rhubarbarum*. Tourn. Inst. R. H. 89. Tab. 18. The Rhubarb.

The Characters are,

The Flower has no Empalement; it hath one Petal, which is narrow at the Base, and impervious. The Brim is cut into 6 Parts, which are obtuse and alternately smaller; it hath 9 Hair-like Stamina inserted in the Petal, and is of the same Length, terminated by oblong Twin Summits which are obtuse, and a short three-cornered Germen, with scarce any Style, crowned by 3 feathered Stigmas which are reflexed. The Germen afterward becomes a large three-cornered Seed with acute membranaceous Borders.

The Species are;

1. RHEUM foliis cordatis glabris, spicis compactis obtusis. Rhubarb with smooth Heart-shaped Leaves, and obtuse compact Spikes of Flowers. *Rhaponticum*. Prof. Alp. Ezot. 187. The Rhapontick, or English Rhubarb.

2. RHEUM foliis subvillosis, petiolis aequalibus. Lin. Diff. 1. Tab. 1. Sp. Pl. 372. Rhubarb with hairy Leaves having equal Foot Stalks. *Rhabarbarum folio longiori hirsuto crispo, florum thyrsis longiori & tenuiori*. Amman. Ruth. 9. Rhubarb with a longer hairy curled Leaf, and a longer and slenderer Spike of Flowers.

3. RHEUM foliis cordatis glabris, marginibus sinuatis, spicis divisis nutantibus. Tab. 218. Rhubarb with Heart-shaped smooth Leaves sinuated on their Borders, and divided Spikes of Flowers which nod.

4. RHEUM foliis granulatis, petiolis aequalibus. Lin. Sp. Pl. 372. Rhubarb with granulated Leaves having equal Foot Stalks. *Lapathum Orientale asperum & verrucosum folio, Ribes Arabibus dictum*. Hort. Elt. 191. Tab. 158. Eastern Dock with a rough warted Leaf, called by the Arabians Ribes.

The 1st Sort grows naturally near the Pontick Sea, but has been long an Inhabitant of the English Gardens. When the Seeds were first brought to Europe, they were supposed to be of the true Rhubarb, but upon making Trial of the Roots, they were found greatly inferior to those of the true Rhubarb, and on Examination it was found to be the Rhapontick of *Prosper Alpinus*, commonly called Pontick Rhubarb. This hath a large thick Root which divides into many leis running deep

in the Ground; the Outside is of a reddish brown Colour, and the Inside yellow, from which arise several Leaves in Number according to the Size of the Root; these come up folded in the Spring, and afterward expand themselves; they are of a roundish Heart Shape and smooth, having very thick Foot Stalks of a reddish Colour, a little channelled on their lower Side, but flat at the Top. When the Plant grows in rich Land, the Foot Stalks of the Leaves are near two Feet long, and thicker than a Man's Thumb; the Leaves also are of ten two Feet long, and as many in Breadth, having several strong longitudinal Veins running from the Foot Stalk to the Borders; they are of a deep green, a little waved on their Edges, and have an acid Taste, but particularly the Foot Stalks, which are now frequently used for making of Tarts. From between the Leaves arise the Flower Stem of a purple Colour, and garnished with one Leaf at each Joint, of the same Shape with those below, but smaller, and sit close to the Stalk. The Stalks grow from 2 to 3 Feet high, according to the Strength of the Ground, and are terminated by thick close obtuse Spikes of white Flowers; these appear the Beginning of June, and are succeeded by large triangular brown Seeds, having a Border or Wing at each Angle, which will ripen in August.

The Seeds of the 2d Sort were sent me from Leyden by the late Dr. Boerhaave by the Title of *Rhabarbarum Chinesum verum*, or true China Rhubarb, which succeeded in the Chelsea Garden. The Root of this Sort divides into a greater Number of thick Fibres than that of the first, which runs deeper into the Ground, and is of a deeper yellow within. The Leaves appear much earlier in the Spring; the Foot Stalks are not so much channelled on their under Side, and are plain on their upper; they are not so red nor so thick. The Leaves are longer, running more to a Point, and waved on their Edges; they are a little hairy on their upper Side, and have many strong Veins or Ribs on their under. The Flowers Stem is of a pale brownish Colour, rising about 4 Feet high, dividing into several loose Panicles or Bunches of white Flowers, which appear in May, and are succeeded by triangular Seeds like those of the first Sort, which ripen earlier in the Season.

The Seeds of the 3d Sort were sent me from Petersburg, for the true Tartarian Rhubarb. The Roots of this are large, and do not divide into so many Parts as those of the 2d, and are yellower within; the Leaves appear as early in the Spring; the Foot Stalks are of a pale green, and almost as large as those of the 1st Sort; they have scarce any Channels, and are flat on their upper Side; the Leaves are Heart shaped and smooth, they do not run out to so great Length in a Point as the 2d but are longer than those of the 1st; they are very broad toward their Base, and have very large pale green Ribs on their under Side, a little waved on their Edges, and have a sharp acid Flavour. The Flower Stalk is a pale green, it rises 4 Feet high; they are as large as a common Walking Cane, and garnished at each Joint by one Leaf of the same Shape with those below, but smaller, sitting close to the Stalk; the upper Part of the Stalk divides into small Branches, which are again divided into leis, each sustaining a Panicle or Spike of white Flowers, which appear the latter End of May, and

and are succeeded by large triangular bordered Seeds, like those of the 1st Sort.

The Roots of this last approach nearer to those of the foreign Rhubarb, than either of the other, both in Shape and Quality; and as the Seeds which were sent from *Petersburgh*, were gathered from the Plants growing on the Spot where the Rhubarb is taken up, so there is little Reason to doubt of its being the true Sort, though the Roots which have grown in *England* have not been equal in Quality with the foreign; but this may have been for want of Age, or by being taken out of the Ground at an improper Season; therefore farther Trials may improve it, and as the Plants produce great Plenty of Seeds here, so they may be propagated with great Ease.

Dr. *Linnaeus* seems to think the 2d Sort may be the true Rhubarb, but the Roots of that which have grown here, are very little better than those of the *Rhapontick*, and I have Reason to doubt if it is not a Variety of it; for it is certain, these Plants when growing near each other, are impregnated by each others Farina: for from the Seeds of the *Rhapontick*, which grew close to the 2d Sort, I had a mixture of Plants of both Sorts produced, though the Plant of the 2d Sort did not produce any Seeds, for the Stalk decayed soon after the Flowers faded; and the Seeds of the *Rhapontick* were gathered by myself from one Plant, and were sown in his Grace the Duke of *Bedford's* Garden at *Woburn Abbey*, where there had not been any of these Plants before growing, so that there could be no mixture of Seeds, and yet a third Part of the Plants proved to be of the 2d Sort.

It has been learnedly controverted by the Botanists, whether the *Rhapontick* of the Ancients, and the Rhubarb of the Moderns, is one and the same Plant, some affirming, and others denying that there is any Agreement; the Reasonings on both Sides may be seen in the Appendix to the 2d Volume of *John Baubin's History of Plants*.

The 4th Sort grows naturally on Mount *Libanus*, and other mountainous Pars of *Syria*. This hath a thick fleshy Root, which runs pretty deep in the Ground, from which arise several Leaves in the Spring, which come up folded together, and afterward expand; they have very short Foot Stalks, so spread near the Ground, but during the Spring their Borders are erect, and form a Sort of Hood having several Folds, and are curled and waved on their Edges; they are of a purplish green, and have purple Veins and Borders; their Surface appears studded with rough Protuberances, and when the Leaves are fully expanded in Summer, they are a Foot long and above two broad; their under Side is paler than the upper, and their Borders appear fringed. I have not seen this Plant in flower, but the Seeds of it were brought from Mount *Libanus*, by the Right Rev. Dr. *Pocock*, the present Bishop of *Oxford*; these were large, and covered with a succulent Pulp of a deep red Colour, and very astringent Taste; this succulent Covering may have occasioned its being taken for a Berry, by many of the old Writers; the Shape of the Seed is like that of the other Species.

These Plants are all propagated by Seeds which should be sown in Autumn soon after they are ripe, and then the Plants will come up the following Spring; but

if they are kept out of the Ground till Spring, they will not come up till the next Spring, so that a Year will be lost. The Seeds should be sown where the Plants are designed to remain, for as their Roots are large and fleshy, when transplanted, they do not recover their Removal in less than 2 Years; nor will the Roots of those which are transplanted, ever grow so large and fair, as those which remain where they were sown. When the Plants appear in Spring, the Ground should be hoed over to cut up the Weeds, and where they are too close some should be cut up, to allow Room for the others to grow, in the same Manner as is practised for Carrots and Parsneps, leaving them at the first hoeing 6 or 8 Inches asunder, for Fear of Accidents, but at the 2d Time of hoeing they may be separated to a Foot and a Half Distance or more. After this the Plants will require no other Culture, but to keep them clean from Weeds, which as soon as they appear, if the Ground is scuffled over with a *Dutch Hoe* in dry Weather, may be done for a small Expence. If this is begun early in the Spring before the Weeds are large, they will soon die, and by repeating it two or three Times at proper Intervals, during the Spring, the Ground will be made clean. When the Plants spread out their Leaves to cover the Ground, they will prevent the Growth of Weeds.

In Autumn the Leaves of these Plants decay, then the Ground should be made clean, and in Spring, before the Plants begin to put up new Leaves, the Ground should be hoed and made clean again; the 2d Year after the Plants come up, many of the strongest will produce Flowers and Seeds, but the 3d Year most of them will flower. The Seeds of these should be carefully gathered when ripe, and not permitted to scatter, lest they should grow to injure the old Plants. The Roots of these Plants will remain many Years without decaying, and I am informed, that the old Roots of the true Rhubarb, are much preferable to the young ones. They delight in a rich Soil, not too dry nor over moist, and where there is a good Depth for their Roots to run down in such Land, their Leaves will be very large, and their Roots grow to a great Size.

The 1st Sort is now frequently cultivated in Gardens, for the Foot Stalks of their Leaves, which are peeled and made into Tarts in the Spring: It is also kept in Gardens, to supply the Shops with the Roots, which are used in Medicine.

The true Rhubarb is now sown in many Gardens, and may probably succeed so well here in Time, as to supply our Consumption.

RHEXIA. Gron. Flor. Virg. 41. Lin. Gen. Pl. 423.

The Characters are,

The Empalement of the Flower is permanent, oblong, tubulous, and of one Leaf, swelling below but divided into 4 Parts at the Brim. The Flower has 4 roundish Petals inserted in the Empalement, which spread open. It hath 8 slender Stamina inserted in the Empalement, terminated by declining furrowed Summits, which are narrow, obtuse, and moveable. It has a roundish Germen, supporting a declining Style the Length of the Stamina, crowned by a thick oblong Stigma. The Germen afterward becomes a roundish Capsule with 4 Cells in the swollen Empalement opening with 4 Valves, and filled with roundish Seeds.

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The Species are,

1. *RHEXIA calycibus glabris*. Flor. Virg. 41. *Rhexia* with smooth Empalements. *Lyfimachia non papposa Virginiana*, *tuberariae foliis birsutis*, flore tetrapetalo rubello. Pluk. Phyt. Tab. 202. f. 8. Virginian Loose-strife without Down, and having a hairy Leaf like *Tuberaria*, with a red Flower having four Petals.

2. *RHEXIA foliis ciliatis*. Lin. Sp. Pl. 346. *Rhexia* with fine hairy Leaves. *Lyfimachia non papposa, terrae Mariana, leptoneuros*, flore tetrapetalo rubello, folio & caule birsutis ferruginea bispidis Pluk. Phyt. 428. f. 1. Loosestrife of Maryland having no Down, but a reddish Flower with 4 Petals, and a Leaf and Stalk covered with standing Iron-coloured Hairs.

The 1st Sort was discovered by Mr. Banister in Virginia, from whence he sent the Seeds to England, which succeeded in several Gardens. This rises with an erect Stalk near a Foot and a Half high, which is four-cornered and hairy, garnished with Spear-shaped Leaves about two Inches long and half an Inch broad; they are hairy, entire, and placed opposite. The Stalk has two Foot Stalks coming out from the Side opposite, at the upper Joint, and is terminated by two other; these each sustain two or three red Flowers with Heart-shaped Petals, which spread open in Form of a Cross. These appear in June, but I have not seen any Seeds produced here.

The 2d Sort grows naturally in Maryland, from whence I received the Seeds. This sends up an erect Stalk about 10 Inches high, garnished with Spear-shaped Leaves about an Inch long, and a third Part of an Inch broad, set on by Pairs opposite; from every Joint of the Stalk come out two short Shoots opposite, garnished with small Leaves of the same Shape as the other; the whole Plant is thick, set with stinging Iron-coloured Hairs. The Stalk divides at the Top into two Foot Stalks, spreading from each other, having one reddish Flower on each; these have 4 Heart-shaped Petals, which spread open like the other. It flowers about the same Time as the 1st, but seldom produces Seeds here. These Plants are propagated by Seeds, which must be procured from the Places where they grow naturally. If the Seeds arrive before the Spring, and are sown soon after they arrive in Pots filled with good fresh Earth, and placed under a Garden Frame to guard them from Frost, the Plants will come up the following Spring; but when the Seeds are sown in the Spring, the Plants rarely come up the first Year. When they come up and are fit to remove, Part of them should be planted in an East Border, where they may have only the Morning Sun, and the others in Pots, that they may be sheltered under a Frame in Winter, for they are sometimes destroyed by severe Frost, though they will live abroad in the common Winters very well; the 2d Year the Plants will flower, and with Care they may be continued three or four Years.

RHINANTHUS. Lin. Gen. Pl. 658. *Pedicularis speciosa*. Tourn. Inst. 171. *Elephas*. Tourn. Cor. 48. Tab. 482. Rattle, or Loufewort.

The Characters are,

The Flower hath a permanent Empalement of one Leaf, which is roundish, compressed, and blown up. It hath one ringent Petal, with a cylindrical Tube the Length of the

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Empalement, compressed at the Base, but opening at the Top. The upper Lip is hooded, compressed, and indented at the Point; the lower Lip plain, spreading, and cut into three obtuse Parts at the Point. It has 4 Stamina shut up in the upper Lip, 2 of which are shorter than the other, terminated by hairy incumbent Summits, and an oval compressed Germen supporting a slender Style, situated with the Stamina, crowned by an inflexed obtuse Stigma. The Germen turns to an oval compressed Capsule with two Cells, opening on the Side and filled with compressed Seeds.

The Species are,

1. *RHINANTHUS corollarum labio superiore compresso, brevior*. Flor. Lap. 248. *Rhinanthus* with a shorter compressed upper Lip. *Pedicularis pratensis lutea, vel cristagalli*. C. B. P. 163. Yellow Meadow Loufewort, yellow Rattle, or Coxcomb.

2. *RHINANTHUS corollarum labio superiore subulato incurvo*. Lin. Sp. Pl. 603. *Rhinanthus* with an Awl-shaped incurved upper Lip. *Elephas Orientalis, flore magno, proboscide incurva*. Tourn. Cor. 48. Eastern Elephants Head, with a large Flower and an incurved Trunk.

3. *RHINANTHUS corollarum labio superiore subulato recto*. Prod. Leyd. 298. *Rhinanthus* with an erect Awl-shaped upper Lip. *Elephas Italica, flore magno, proboscide erecta*. Tourn. Cor. 48. Italian Elephant's Head, with a large Flower and an erect Trunk.

The 1st Sort is a common Weed in most of the low Pastures and Meadows in every Part of England, where it is one of the most troublesome Weeds among the Grass, spreading itself over the whole Ground, so that in many of the Water Meadows, there is more of this Plant than Grass. It is an annual, which flowers the latter End of May, so that the Seeds ripen by the Time the Grass of these Meadows is mowed, and the Seeds scatter and fill the Ground with young Plants the following Spring; therefore, to destroy it, the Grass should be cut as soon as the Flowers of this Plant appear.

It is well known, so requires no Description; and as it is never cultivated, so it is mentioned chiefly to introduce the others; but here I must observe, that the Dutch carry on a Trade with the Seeds and Seed Vessels of one Species of this Genus to Germany, whose Seed Vessels appear very like those of this first Sort, they call it *Semen Savadillor*; the Use of it is to kill Vermin of every Sort, especially Bugs; they boil a Quantity of the Seeds and Capsules in common Water, with which they wash their Wainscots, Bedsteads, &c. where any of these Insects are lodged, and it effectually destroys them.

The 2d Sort was discovered by Dr. Tournefort on the Sides of the Black Sea, growing in a fat Soil and shady Situation. The Flower being shaped like an Elephants Head, induced *Fabius Columna* to give the Title of *Elephas* to the 3d Species, which he found growing naturally in the Kingdom of Naples, and Tournefort after him established the Genus with that Title. The Stalks of this rise a Foot and a Half high, they are hollow, four-cornered, and hairy, garnished with Leaves placed opposite, having short Foot Stalks; they are about two Inches long, and half an Inch broad, crenated on their Edges, hairy, and veined. The upper Part of the Stalk is garnished with Flowers growing opposite from the Wings of the Leaves; these have curved

curved Tubes, which divide into two Lips; the under Lip is an Inch long, broad, and cut into three obtuse Parts, the Middle Segment being the broadest; the upper Lip is like a Helmet, and longer than the lower. The Flower is yellow, with a Spot of Feuilemort or Fillemot on the lower Lip, and the upper Lip has two red Spots on the Top; the Flowers have an agreeable Scent.

The 3d Sort grows naturally in the Kingdom of Naples; this is much like the former Sort but the Proboscis of the Flower is erect, and the lower Lip has no Spot.

These Plants despise Culture, so are with great Difficulty kept in Gardens; they are biennial, so are only propagated by Seeds; these should be sown soon after they are ripe, otherwise they will not succeed, nor will the Plants bear removing, so they should be sown where they are to remain, which should be in a moist rich Soil and a shady Situation: When the Plants come up, they must be thinned and kept clear from Weeds, which is all the Culture they require. If the Seeds of these Plants are permitted to scatter, the Plants will come up better than those which are sown by Hand.

RHIZOPHORA, *Lin. Gen. Plant. 524. Mangles. Plum. Nov. Gen. 13. Tab. 15.* This is called Mangrove by the Inhabitants of the *West-Indies*; there are several Species of this Genus which grow in Salt Water Rivers both in the *East* and *West-Indies*; but as they will not grow upon Land, it is needless to enumerate them here.

RHODIOLA, *Lin. Cen. Pl. 997. An campseros. Tourn. Inst. R. H. 264.* Rose-root.

The Characters are,

It hath male and female Flowers in different Plants; the male Flowers have an Empalement of one Leaf, which is cut into 4 or 5 Segments almost to the Bottom; they have 4 obtuse Petals, which are much longer than the Empalement, and 4 Nectaria which are erect and shorter than the Empalement, with 8 Awl-shaped Stamina, which are longer than the Petals, terminated by obtuse Summits. they have 4 oblong acute Germina without Style or Stigma, so are abortive. The female Flowers have the same Empalement as the male, they have 4 obtuse permanent Petals equal with the Empalement and 4 Nectaria like the male; they have 4 oblong acute-pointed Germina fitting upon an erect Style crowned by obtuse Stigmas. The Germina become 4 horned Capsules, compressed on their inner Side, filled with roundish Seeds.

The Species are,

1. **RHODIOLA** *staminibus corollâ duplo longioribus.* Rose-root with Stamina twice as long as the Petals. *Anacampseros radice rosam spirante major. Tourn. Inst. R. H. 264.* Greater Orpine with a Rose-scented Root.

2. **RHODIOLA** *staminibus corollâ fere quantibus.* Rose-root with Stamina scarcely equalling the Length of the Petals. *Anacampseros radice rosam spirante minor. Tourn. Inst. R. H. 264.* Smaller Orpine with a Rose-scented Root.

The 1st Sort grows naturally in the Clefts of the Rocks and rugged Parts of the Mountains of *Wales*, *Yorkshire*, and *Westmoreland*. This has a very thick fleshy Root, which when bruised or cut, sends out an Odour like Roses; it has many Heads, from whence in the Spring come out thick succulent Stalks like those

of Orpine, about 9 Inches long, closely garnished with thick succulent Leaves of a gray Colour, an Inch long, and half an Inch broad, indented on their Edges toward the Top, and placed alternately on every Side the Stalk. The Stalk is terminated by a Cluster of yellowish herbaceous Flowers, which appear early in *May*; the male Flowers have Stamina twice the Length of the Petals. They have a very agreeable Scent, but are not of long Continuance.

The 2d Sort grows naturally on the *Alps*; the Roots of this are smaller than those of the other Sort, the Stalks are small, and not above 5 Inches long; the Leaves are small but shaped like those of the other Sort, and end with a purple Point; the Petals of the Flowers are purplish, and the Stamina but little longer than the Petals. This flowers later than the other Sort. I have cultivated both these Plants in the same Soil above 30 Years, and never found either of them vary.

These Plants are preserved in the Gardens of the Curious, for Variety; they are easily propagated, either by Cuttings or parting the Roots. If by Cuttings, they should be planted the Beginning of *April*, soon after they come out from the Head, in a shady Border, and covered close down with a Glass, keeping them dry; they will put out Roots in about six Weeks. But the Cuttings should be laid in a dry Room at least a Week before they are planted, that the Wounds may be dried, otherwise they are subject to rot.

If they are propagated by parting the Roots, that should be performed the Beginning of *September*, at which Time their Stalks begin to decay; and if the fleshy Parts of the Roots are cut or broken, they should be laid to dry a few Days before they are planted, for the same Reason as the Cuttings. These Plants require a shady Situation and a dry undunged Soil, in which they will continue many Years.

RHODODENDRON, *Lin. Gen. Pl. 484. Chamaerhododendros. Tourn. Inst. R. H. 604. Tab. 373.* Dwarf Rose-bay.

The Characters are,

The Flower has a permanent Empalement cut into 5 Parts; the Flower hath one Wheel Funnel-shaped Petal, spreading open at the Brim; it has 10 slender Stamina which decline, the Length of the Petals, terminated by oval Summits, and a five cornered Germin supporting a slender Style the Length of the Petals, crowned by an obtuse Stigma. The Germin afterward becomes an oval Capsule with 5 Cells, filled with small Seeds.

The Species are,

1. **RHODODENDRON** *foliis ciliatis nudis, corollis infundibuliformibus.* *Lin. Sp. Pl. 292.* Rose-bay with naked hairy Leaves, and Funnel shaped Petals. *Chamaerhododendros Alpina, villosa. Tourn. Inst. R. H. 604.* Hairy Alpine Dwarf Rose-bay.

2. **RHODODENDRON** *foliis glabris, subtus leprosis, corollis infundibuliformibus.* *Lin. Sp. Pl. 392.* Rose-bay with smooth Leaves hoary on their under Side, and Funnel-shaped Petals. *Chamaerhododendros Alpina glabra. Tourn. Inst. 604.* smooth Alpine Dwarf Rose-bay.

The 1st Sort grows naturally on the *Alps*, and on several Mountains in *Italy*. This is a low Shrub, which seldom rises 2 Feet high, sending out many short ligneous Branches, covered with a light brown Bark, garnished closely

closely with oval Spear-shaped Leaves, about half an Inch long, and a Quarter of an Inch broad, sitting pretty close to the Branches; they are entire, and have a great Number of fine Iron-coloured Hairs on their Edges and under Side. The Flowers are produced in Bunches at the End of the Branches; they have one Funnel-shaped Petal; the Tube is about half an Inch long; the Brim cut into five obtuse Segments, which spread half open; they are of a pale red Colour, and have 10 Stamina in each, the Length of the Tube; after the Flowers are past, the Germen in the Center turns to an oval Capsule with 5 Cells, filled with small Seeds. It flowers in May, and the Seeds ripen in August.

The 2d Sort grows naturally on the Alps and Apennines; this rises with a shrubby Stalk near 3 Feet high, sending out many irregular Branches, covered with a purplish Bark, and closely garnished with smooth Spear-shaped Leaves, an Inch and a Half long, and half an Inch broad in the Middle; they are entire, and their Borders reflexed backward; the upper Side is of a light lucid green, and the under of an Iron Colour; they are placed all round the Branches, without any Order. The Flowers are produced in round Bunches at the End of the Branches, they are Funnel-shaped, having short Tubes, cut into 5 obtuse Segments at the Brim, which spread a little open; they are of a pale Rose Colour, and make a good Appearance. This Sort flowers in June, but does not ripen Seeds here.

There are some other Species of this Genus, which grow naturally in the Eastern Countries, and others are Natives of America, but the two Sorts here mentioned are all I have seen in the English Gardens; and these are difficult to propagate and preserve in Gardens, for they grow naturally on barren rocky Soils and in cold Situations, where they are covered with Snow great Part of the Winter, so that when they are planted in better Ground, they do not thrive, and for Want of their usual Covering of Snow in Winter, they are frequently killed by Frost, but could these Plants be tamed, and propagated in Plenty, they would be great Ornaments to the Gardens.

They are propagated by Seeds, but these are so very small, that if they are covered deep, they will not grow. The Seeds should be sown as soon as possible, after they are ripe, in Pots filled with fresh gentle loamy Earth, and very lightly covered with a little fine Earth; then the Pots should be plunged up to their Rims in a shady Border, and in hard Frost covered with Bell or Hand Glasses, taking them off in mild Weather. If these Seeds are sown early in Autumn, the Plants will come up the following Spring; they must be shaded from the Sun, especially the first Summer, and duly refreshed with Water, and in Autumn following they may be transplanted to a shady Situation, and on a loamy Soil, covering the Ground about their Roots with Moss, which will guard them from Frost in Winter, and keep the Ground moist in Summer.

RHUS. *Tourn. Inst. R. H. 611. Tab. 381. Lin. Gen. Pl. 331.* [It takes its Name from *ῥέω* to flow, because it stops dysenterical Fluxes of the Bowels.] Sumach.

The Characters are,

The Empalement of the Flower is permanent, erect, and cut into 5 Parts. The Flower has 5 oval, erect, spreading

Petals, and 5 short Stamina terminated by small Summits, shorter than the Petals; it has a roundish Germen as large as the Petals, with scarce any Style, crowned by 3 small Stigmas. The Germen afterward becomes a roundish hairy Berry inclosing a single hard Seed of the same Form.

The Species are,

1. RHUS *foliis pinnatis obtusiusculis serratis, ovato-lanceolatis subtus villosis.* Sumach with winged Leaves obtusely sawed, ovally Spear-shaped, and hairy on their under Side. *Rhus folio ulmi.* C. B. P. 414. Elm-leaved Sumach.

2. RHUS *foliis pinnatis integerrimis, cordato-oblongis acuminatis, ramis petiolisque villosissimis.* Sumach with entire winged Leaves which are oblong, Heart-shaped, end in acute Points, and have very hairy Branches and Foot Stalks. *Rhus Virginianum.* C. B. P. app. 517. Virginian Sumach.

3. RHUS *foliis pinnatis serratis lanceolatis utrinque glabris.* Sumach with winged Leaves which are Spear-shaped, and smooth on both Sides. *Rhus Virginicum, paniculata sparsa, ramis patulis glabris.* Hort. Elt. 323. Virginian Sumach with a loose Panicle, and smooth spreading Branches.

4. RHUS *foliis pinnatis serratis lanceolatis, subtus incanis, panicula compacta.* Sumach with sawed, Spear-shaped, winged Leaves hoary on their under Side, with a compact Panicle. *Rhus Carolinianum, panicula speciosa coccinea.* Catesb. Hist. Carol. Carolina Sumach having a beautiful scarlet Panicle.

5. RHUS *foliis pinnatis, obsolete serratis, lanceolatis, utrinque glabris, panicula composita.* Sumach with winged Spear shaped Leaves slightly sawed, and a compound Panicle. *Rhus Canadense, folio longiori utrinque glabro.* Tourn. Inst. R. H. 611. Canada Sumach with a longer Leaf which is smooth on both Sides.

6. RHUS *foliis pinnatis integerrimis, petiolo membranaceo articulado.* Flor. Leyd. Prod. 24. Sumach with entire winged Leaves, and a jointed membranaceous Foot Stalk. *Rhus angustifolium.* C. B. P. 414. Narrow-leaved Sumach.

7. RHUS *foliis pinnatis, foliolis ovatis, obtuse serratis, petiolo membranaceo villosis.* Sumach with winged Leaves, oval Lobes bluntly sawed, and a hairy Foot Stalk having jointed Membranes or Wings. *Rhus Sinarum lactescens, costâ foliorum alata.* Pluk. Amaltb. 183. China milky Sumach with winged Membranes to the Leaves.

8. RHUS *foliis ternatis, foliolis ovatis subtus tomentosis.* Three-leaved Sumach with oval Leaves downy on their under Side. *Rhus Africanum, trifoliatum majus, folio subrotundo integro, molli & incauo.* Pluk. Phyt. Tab. 219. fig. 8. Greater, three-leaved, African Sumach with a round entire Leaf which is soft and hoary.

9. RHUS *foliis ternatis, foliolis subpetiolatis, rhombeis angulatis, subtus tomentosis.* Lin. Sp. Pl. 266. Three-leaved Sumach with angular rhomboid Lobes having Foot Stalks, and downy on their under Side. *Rhus Africanum trifoliatum majus, foliis obtusis & incisus hirsutis pubescentibus.* Pluk. Phyt. Tab. 219. fig. 7. Greater, African, three-leaved Sumach with obtuse cut Leaves covered with soft Hairs.

10 RHUS *foliis ternatis, foliolis sessilibus cuneiformibus levibus.* Vir. Cliff. 25. Three-leaved Sumach whose Lobes are smooth, Wedge-shaped, and sit close to the Stalk.

Stalk. *Rhus Africanum*, trifoliatum minus glabrum, splendente folio, subrotundo integro. Pluk. Phyt. 219. fig. 9. Three-leaved African Sumach with a smooth, shining, roundish entire Leaf which is small.

11. *Rhus foliis ternatis, foliolis ovatis nervosis, marginibus saepius dentatis, utrinque viridibus*. Sumach with trifoliate Leaves having oval veined Lobes which are generally indented on their Edges, and green on both Sides. *Rhus Africanum*, trifoliatum majus glabrum, splendente utrinque folio subrotundo medio quandoque crenato. Boerb. Ind. alt. 2. 229. Greater, African, three-leaved Sumach with smooth roundish Leaves on both Sides which are sometimes crenated in the Middle.

12. *Rhus foliis ternatis, foliolis petiolatis lineari-lanceolatis integerrimis subtus tomentosis*. Hort. Cliff. III. Sumach with trifoliate Leaves, whose Lobes stand upon Foot Stalks, are linear, Spear-shaped, entire, and downy on their under Side. *Rhus Africanum* trifoliatum majus, foliis subtus argenteis acutis & margine incis. Pluk. Phyt. Tab. 219. fig. 6. Greater, African, three-leaved Sumach with Leaves silvery on their under Side, and cut on their Edges.

13. *Rhus foliis ternatis, lineari-lanceolatis integerrimis sessilibus utrinque viridibus*. Sumach with trifoliate Leaves having linear, Spear-shaped, entire Lobes sitting close to the Foot Stalk, and green on both Sides.

14. *Rhus foliis ternatis, foliolis ovatis acuminatis integerrimis, petiolatis, floribus paniculatis terminalibus*. Three-leaved Sumach with oval acute-pointed Lobes, which are entire, and grow upon Foot Stalks growing in Panicles, which terminate the Branches. *Phaeolus arboreseens Zeylanicus monocarpus*, Radalijawel. Herm. Mus. Zeyl. 39. Tree Kidney Bean of Ceylon with a single Fruit, called Radalijawel.

15. *Rhus foliis simplicibus obovatis*. Lin. Sp. Pl. 267. Sumach with single, obverse, oval Leaves. *Cotinus Coriaria*. Dod. Pempt. 780. Venice Sumach or Coccygria.

The 1st Sort of Sumach grows naturally in Italy, Spain, and Turkey; the Branches of this Tree are used instead of Oak for tanning Leather, and I have been informed that the Turkey Leather is all tanned with this Shrub. This has a ligneous Stalk which divides into many irregular Branches, and rises to the Height of 8 or 10 Feet; the Bark is hairy, and of an herbaceous brown Colour; the Leaves are winged, and composed of 7 or 8 Pair of Lobes terminated by an odd one; the Lobes are about an Inch and a Half long, and half an Inch wide in the Middle; they are bluntly sawed on their Edges, and hairy on their under Side, of a yellowish green Colour, and the Leaves are placed alternately on the Branches; the Flowers grow in loose Panicles at the End of the Branches, which are of a whitish herbaceous Colour, each Panicle being composed of several close Spikes of Flowers sitting close to the Foot Stalks; these appear in July, but are not succeeded by Seeds in England. The Leaves and Seeds of this Sort are used in Medicine, and are esteemed very restraining and stiptick, and good for all Kinds of Fluxes and Hæmorrhages; used both inwardly and outwardly they resist Putrefaction, and stop Gangrenes and Mortifications.

The 2d Sort grows naturally in almost every Part of North America; this hath a woody Stem, from which are sent out many regular Branches the whole Length,

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which are generally crooked and deformed. The young Branches are covered with a soft Velvet-like Down, resembling greatly that of a young Stag's Horn both in Colour and Texture, from whence the common People have given it the Appellation of Stags-horn; the Leaves are winged, composed of 6 or 7 Pair of oblong Heart-shaped Lobes, terminated by an odd one, ending in acute Points; they are entire, and hairy on their under Side, as is also the Mid-rib. The Flowers are produced in close Tufts at the End of the Branches; these are succeeded by Seeds, which are inclosed in purple woolly succulent Covers, so that the Bunches are of a beautiful purple Colour in Autumn, and the Leaves, before they fall change to a purplish Colour first, and then to a Feuilemort. This is used for tanning Leather in America, and the Roots are often prescribed in Medicine in the Countries where the Plant grows naturally.

The 3d Sort grows naturally in many Parts of North America; this is commonly titled by the Gardeners New England Sumach. The Stem of this Sort is stronger, and rises higher than that of the former; the Branches spread more horizontally; they are not quite so downy as those of the last, and the Down is of a brownish Colour; the Leaves are composed of many more Pair of Lobes, which are smooth on both Sides; the Flowers are disposed in loose Panicles, which are of an herbaceous Colour; they appear about the same Time with those of the former, but are not succeeded by Seeds in England.

The 4th Sort grows naturally in Carolina; the Seeds of this were brought from thence by the late Mr. Catesby, who has given a Figure of the Plant in his natural History of Carolina. This is by the Gardeners called the scarlet Carolina Sumach; it rises commonly to the Height of 7 or 8 Feet, and divides into many irregular Branches, which are smooth, of a purple Colour, and pounced over with a grayish Powder, as are also the Foot Stalks of the Leaves, which are of a purplish Colour. The Leaves are composed of 7 or 8 Pair of Lobes terminated by an odd one; these are not always placed exactly opposite on the Mid-rib, but sometimes alternate; they are 3 Inches long, and almost 1 broad in the Middle, ending in acute Points, and sawed on their Edges. The upper Sides of the Lobes are of a dark green, and the under hoary, but smooth. The Flowers are produced at the End of the Branches in very close Panicles, which are large, and of a bright red Colour; they appear in July, and continue till Autumn, but the Seeds do not ripen in England.

The 5th Sort grows naturally in Canada, Maryland, and several other Parts of North America; this hath smooth Branches, of a purple Colour, covered with a gray Pounce. The Leaves are composed of 7 or 8 Pair of Lobes terminated by an odd one; the Lobes are Spear-shaped, 4 Inches and a Half long, and 1 broad in the Middle, terminating in acute Points, and are a little sawed on their Edges; they are of a lucid green on their upper Surface, but hoary on their under, and smooth. The Flowers are produced at the End of the Branches in large Panicles, composed of several smaller, each standing upon separate Foot Stalks; they are of a deep red Colour, and the whole Panicle is covered with a gray Pounce, as if it had been scattered over them. This Sort

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flowers at the same Time with the 4th, but does not ripen Seeds here.

The 6th Sort grows naturally in most Parts of *North America*, where it is known by the Title of Beech Sumach, probably from the Places where it grows. This is of humbler Growth than either of the former, seldom rising more than 4 or 5 Feet high, dividing into many spreading Branches, which are smooth, of a light brown Colour, and pretty closely garnished with winged Leaves; these are composed of 4 or 5 Pair of narrow Lobes terminated by an odd one; they are entire, about 2 Inches long, and half an Inch broad, ending in acute Points; they are of a light green on both Sides, and in Autumn change to purplish. The Mid-rib, which sustains the Lobes, has on each Side a winged or leafy Border, which runs from one Pair of Lobes to another, ending in Joints at each Pair, by which it is easily distinguished from the other Sort. The Flowers are produced in loose Panicles at the End of the Branches; they are of a yellowish herbaceous Colour, and appear in *July*, but the Seeds do not ripen in *England*.

These six Sorts are hardy Plants, and will thrive in the open Air here. The 1st and 4th Sorts are not quite so hardy as the others, so must have a better Situation, otherwise their Branches will be injured by severe Frost in the Winter; they are easily propagated by Seeds, which, if sown in Autumn, will come up the following Spring, but if sown in the Spring, they will not come up till the next Spring; they may be either sown in Pots, or the full Ground. If they are sown in Pots in Autumn, the Pots should be placed under a common Frame in Winter, where the Seeds may be protected from hard Frost, and, if in the Spring the Pots are plunged into a very moderate hot Bed, the Plants will soon rise, and have thereby more Time to get Strength before Winter. When the Plants come up, they should be gradually hardened to bear the open Air, into which they should be removed as soon as the Weather is favourable, placing them where they may have the Morning Sun, and, during the first Summer, they must be kept clean from Weeds, and in dry Weather, if they are supplied with Water, it will greatly promote their Growth, but toward Autumn it will be proper to stint their Growth by keeping them dry, that the Extremity of their Shoots may harden, for if they are replete with Moisture, the early Frosts in Autumn will pinch them, which will cause their Shoots to decay almost to the Bottom, if the Plants are not screened from them. If the Pots are put under a common Frame again in Autumn, it will secure the Plants from Injury, for while they are young and soft, they will be in Danger of suffering, if the Winter proves very severe; but in mild Weather they must always enjoy the open Air, therefore should never be covered but in Frost. The Spring following, just before the Plants begin to shoot, they should be shaken out of the Pots, and carefully separated, so as not to tear the Roots, and then transplanted into a Nursery in Rows 3 Feet asunder, and 1 Foot Distance in the Rows. In this Nursery they may stand two Years to get Strength, and then may be transplanted where they are to remain.

The Seeds which are sown in the full Ground, may be covered the first Winter with some old Tanners Bark

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to keep out the Frost, and in Spring it may be drawn off again after the Danger of hard Frost is over, and when the Plants come up, they must be kept clean from Weeds, which is all the Care they will require the 1st Summer, but as the Plants in full Ground are apt to grow luxuriant, and continue growing late in Autumn, they should be covered to screen them from the early Frost, which will otherwise kill their Tops, and then they will die down a considerable Length, and sometimes almost to the Ground in hard Winters. In the Spring following the Plants may be taken up carefully, and transplanted into a Nursery at the same Distance as is before directed.

This Method of propagating the Plants from Seeds is seldom practised after a Person is once possessed of the Plants, for they are very subject to send up a great Number of Suckers from their Roots, whereby they are easily propagated, except the first Sort, which seldom puts out any, so is with greater Difficulty propagated, which occasions its Scarcity in *England*, for unless a Supply of Seeds from the warmer Countries can be procured, there is no other Method of propagating it but by Layers or Cuttings, which do not take Root very freely, and therefore some Persons cut off some of the Roots of the Plants in the Spring, and put them upon a moderate hot Bed, which will often cause them to put out Shoots, and thereby young Plants are obtained. The Suckers of all the other Sorts may be taken up, and planted in a Nursery for a Year or two to get Strength, and then may be planted where they are to remain.

These Shrubs are generally planted in all the Plantations of flowering Shrubs in large Gardens, where they make a fine Variety in Autumn, especially the 2d, 4th, and 5th Sorts, with their large purple, or red Panicles, which have a good Effect, but, where these are planted, their Suckers must be every Year taken off, otherwise they will grow up to a Thicket, and destroy the neighbouring Plants.

The 7th Sort grows naturally in the East. The Seeds of this were sent to the Royal Garden at *Paris*, where they succeeded, and from thence I received the Plant, which grew very well in the open Air at *Chelsea* 3 Years, but the severe Winter in 1740 destroyed it, so that it is not quite so hardy as the other Sorts. This rises with a shrubby Stalk, 5 or 6 Feet high, sending out many irregular Branches. The young Shoots and Foot Stalks of the Leaves are covered with a soft brown hairy Down; the Leaves are composed of 2 or 3 Pair of oval Lobes terminated by an odd one; the inner Lobes are small, and the outer large; the first are not more than one Inch long, and three Quarters broad, but the outer are two Inches long, and one and a Quarter broad; the End Lobe is Heart-shaped, ending in an acute Point, and is three Inches long and two broad at the Base; they are fawed on their Edges, and are hoary on their under Side; the Mid-rib, which sustains the Lobes, has two leafy Membranes running along the Sides from Joint to Joint, which are narrow below, and gradually increase in their Breadth to the next Joint. When the Leaves are broken, they emit a milky Juice from the Wound. As I have not seen the Flowers of this Sort, I can give no Account of them.

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This Sort does not put out Suckers from the Root like the *American* Kinds, so must either be propagated by Layers, or by cutting off some of the Roots, and planting them on a gentle hot Bed in the same Manner as is practised for the 1st Sort, by which Method I think it may be propagated, but my Plant was too weak for this Purpose, when it was destroyed.

The 8th Sort grows naturally at the *Cape of Good Hope*; this hath a strong woody Stalk, which rises 10 or 12 Feet high, covered with a gray Bark, and sends out many smooth Branches on every Side garnished with trifoliate Leaves standing upon pretty long Foot Stalks. The Lobes of the Leaves are oval and entire; they are about an Inch long, and three Quarters broad, hoary on their under Side, but smooth, and of a lucid green on their upper; the Flowers are produced from the Wings of the Leaves in small Bunches; they are of an herbaceous Colour, and appear in *July*, but fall away in *England* without having any Seeds.

The 9th Sort also grows naturally at the *Cape of Good Hope*; this rises with a woody Stalk to the Height of 7 or 8 Feet, covered with a brown Bark, and sends out many irregular Branches, garnished with trifoliate Leaves standing upon long Foot Stalks. The Lobes of this Sort are angular, and shaped like a Rhombus; they are near 2 Inches long, and 1 broad, downy on their under Side, but of a dark green on their upper. The Flowers come out in slender Bunches from the Side of the Branches; they are of a whitish herbaceous Colour, and soon fall away.

The 10th Sort grows naturally at the *Cape of Good Hope*; this rises with a woody Stalk, like the 8th, dividing into many Branches covered with a brown Bark, and garnished with trifoliate Leaves, whose Lobes are Wedge or Heart-shaped, of a lucid green, and sit close to the Foot Stalk. This Sort does not flower here, so far as I can find, for I have had some of the Plants in my Care almost 40 Years, but they have not flowered as yet.

The 11th Sort is a Native of the *Cape of Good Hope*. This hath some Resemblance of the former Sort, but the Lobes of the Leaves are twice as large, and are oval, with some Indentures on their Edges; they have several transverse Veins running from the Mid-rib to the Edges, and are very stiff, of a bright lucid green on both Sides. This Sort has not flowered here so far as I can learn.

The 12th Sort came from the *Cape of Good Hope*, where it grows naturally. This rises with a woody Stalk 7 or 8 Feet high, dividing into several irregular Branches, covered with a dark brown Bark, and garnished with narrow, Spear-shaped, trifoliate Leaves standing on pretty long Foot Stalks. The Lobes are 2 Inches long, and half an Inch broad in the Middle, ending in acute Points; they are downy on their under Side, but of a lucid green on their upper. The Flowers are produced in small loose Bunches from the Side of the Branches; they are small, of an herbaceous Colour, and fall off without having any Seeds succeed them.

The 13th Sort is a Native of the *Cape of Good Hope*; this rises with an upright woody Stalk 5 or 6 Feet high, sending out many Branches every Way covered with a smooth brown Bark, and garnished with narrow, Spear-

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shaped, trifoliate, entire Leaves standing on short Foot Stalks. The middle Lobe of the Leaves is near an Inch and a Half long, and a Quarter of Inch broad; the two Side Lobes are shorter and narrower; they sit close to the Foot Stalk, are of a lucid green, and have a deep Furrow Lengthways through the Middle. This Sort has not yet flowered in *England*.

All these *African* Sorts are too tender to live through the Winter in the open Air in *England*; so they are planted in Pots or Tubs, and housed in Autumn, and during the Winter must be treated as other hardy Green-house Plants. They all retain their Leaves through the Year, so make a good Variety when intermixed with other Plants in the Green-house in Winter. They may be propagated by Cuttings, which should be planted in Pots filled with loamy Earth the Beginning of *April*, and plunged into a very moderate hot Bed, covering them close with Hand or Bell Glasses, and screening them from the Sun in the Heat of the Day. The Cuttings should be now and then refreshed with Water, but it should not be given in too great a Quantity. With this Management they will put out Roots in about two Months, and, when they begin to shoot, they should have Air admitted to them, and be gradually hardened to bear the open Air, into which they must be removed, placing them in a sheltered Situation, and when the Cuttings have filled the Pots with their Roots, they should be shaken out, and parted carefully, planting each into a separate small Pot, placing them in the Shade, till they have taken new Root, when they may be intermixed with other exoticks in a sheltered Situation for the Summer, and in Autumn removed into the Green-house.

The 14th Sort grows naturally in the Island of *Ceylon*; this rises with a woody Stalk 10 or 12 Feet high, sending out many Branches, which are cloathed with trifoliate Leaves standing on pretty long Foot Stalks. The Lobes of the Leaves are oval, about two Inches long, and an Inch and a Half broad, terminating in acute Points; they are thick, smooth, and of a lucid green. The Flowers are produced in loose Panicles at the End of the Branches; they are of a whitish herbaceous Colour, and small. These seldom appear in *England*, but when they do, are not succeeded by Seeds here.

This Plant is tender, so must be placed in a moderate Stove, otherwise it will not live through the Winter in *England*. It may be propagated by Cuttings in the same Way as the former Sorts, but requires a warmer Bed than those to promote the putting out Roots. When they have good Roots, they should be each transplanted into a separate small Pot, and plunged into the Tan Bed, and treated in the same Way as other tender exoticks.

The 15th Sort grows naturally in *Spain*, *Italy*, and the *Levant*, where the Leaves are used for tanning Leather; this rises with an irregular shrubby Stalk to the Height of 10 or 12 Feet, sending out many spreading irregular Branches covered with a smooth brown Bark, and garnished with single, obverse, oval Leaves about 2 Inches long, and of the same Breadth, rounded at their Points, on long Foot Stalks; they are smooth, stiff, and of a lucid green, having a strong Mid-rib, from whence several transverse Veins run toward the Border.

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The Flowers come out at the End of the Branches upon long Hair-like Foot Stalks, which divide and branch into large Hair-like Bunches of a purplish Colour; they are small, white, and composed of 5 small oval Petals which spread open; these appear in July, but are not succeeded by Seeds in England.

This Plant is cultivated for Sale in the Nursery Gardens near London; it is propagated by Layers, which should be laid down in Autumn, and by next Autumn they will have taken Root, when they may be taken off from the old Plants, and transplanted in a Nursery, where they may grow a Year or two to get Strength, and then be planted where they are to remain. This Shrub is so hardy, as not to be injured by Frost in England.

RIBES. Lin. Gen. Pl. 247. *Grossularia*. Fourn. Inst. 639. *Ribesum*. Dill. H. Elsb. 246. The Currant Tree. The Characters are,

The Flower has a belied Empalement of one Leaf, cut at the Top into 5 concave obtuse Segments; it hath 5 small, obtuse erect Petals growing to the Border of the Empalement, and 5 Awl-shaped Stamina inserted in the Empalement terminated by incumbent compressed Summits opening at their Border. The roundish Germen is situated under the Flower, supporting a bifid Style, crowned by obtuse Stigmas; it afterward becomes a globular umbilicated Fruit, with one Cell containing many roundish compressed Seeds.

The Species are,

1. *RIBES inerme, racemis glabris pendulis, floribus planiusculis*. Lin. Sp. Pl. 200. Currant without Thorns, having smooth hanging Bunches, and plain Flowers. *Ribes vulgare acidum*. J. B. 2. p. 97. Common four Currant.

2. *RIBES inerme, racemis erectis, bracteis flore longioribus*. Lin. Sp. Pl. 200. Smooth Currant with erect Bunches, and Bractees longer than the Flower. This is the *Ribes Alpinum dulce*. J. B. 2. p. 98. Sweet Alpine Currant.

3. *RIBES inerme, racemis pilosis, floribus oblongis*. Lin. Sp. Pl. 201. Currant without Spines having hairy Branches and oblong Flowers. *Ribes vulgaris fructu nigro*. Rudb. Flor. Lapp. 99. Common black Currant.

4. *RIBES inerme, racemis glabris, floribus campanulatis*. Currant with unarmed Branches, smooth Bunches, and Bell shaped Flowers. *Ribes Americana fructu nigro*. Ed. prior. American black Currant.

The 1st Sort grows naturally in the northern Parts of Europe, but has been long cultivated in Gardens and greatly improved, so that at present there are the following Varieties in the English Garden: The common Currant with small red Fruit, the same with white Fruit, and another with pale Fruit, commonly called the *Champaign Currant*, but, since the two Sorts of Dutch Currants have been introduced, and become plenty, the old red and white have been almost banished, and are now rarely to be found in the English Gardens.

The 2d Sort is kept in a few Gardens for the Sake of Variety, but, as the Fruit is very small, and has little Flavour, it is not cultivated.

The 3d Sort grows naturally in *Helvetia*, *Sweden*, and other northern Countries, and is sometimes cultivated in Gardens for its Fruit, of which is made a Rob, which is greatly esteemed for sore Throats, from whence the Fruit has been called Squinancy Berries for their

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great Use in Quinsies. This Fruit has a strong disagreeable Flavour, and is rarely admitted to the Table.

The 4th Sort grows naturally in *Pennsylvania*, from whence the Plants were sent several Years past, and has been dispersed to most Parts of *England*; this is by some thought to be the same with the common black Currant, but those, who have long cultivated it, know it is very different. The Shoots of this are much smaller and more compact, the Bark is of a darker Colour, the Leaves are smaller, thinner, smoother, and have not a rank Smell like those of the common Sort. The Flowers are smaller, Bell-shaped, and grow in thinner Bunches; the Fruit is smaller, and not so round; this Sort does not produce much Fruit, nor is it so good as to merit cultivation, so the Plant is only kept by Way of Curiosity.

The Fruit of the red and white Currants are greatly esteemed for the Table, and are also very good in Fevers; they are cooling and grateful to the Stomach, quench Thirst, and are somewhat restraining. The Fruit may be procured good much longer than others upon the Trees by planting them in different Situations, for if they are planted against Pales or Walls exposed to the South, the Fruit will ripen in June, and by planting some against North Walls, if they are screened from Birds, and covered in Autumn from Frost, they may be kept till November, and, as the Fruit is greatly used for Tarts, it is very convenient to have a Succession of it for so long a Time.

The *Champaign Currant* differs from the other only in the Colour of the Fruit, which is of a pale red or Flesh Colour. The Taste is so near to the other, as not to be distinguished, but being of a different Colour, it makes a Variety on the Table.

There are Plants of all these Sorts with variegated Leaves, which are kept in some Gardens for Variety, but, as these Variegations go off when the Plants are vigorous, they scarce deserve Notice.

These Sorts may be easily propagated by planting their Cuttings any Time from the Beginning of September to the Middle of October upon a Spot of fresh Earth, in Rows at one Foot asunder, or in Beds, which in the Spring must be kept clear from Weeds, and in very dry Weather, if they are watered, it will greatly promote their Growth. These may remain one or two Years in the Nursery, during which Time they must be pruned up for the Purposes designed, i. e. either to clear Stems about one Foot high, if for Standards, or, if for Walls, Pales, or Espaliers, they may be trained up flat.

Then they should be planted out where they are to remain, for the younger they are planted, the better they will succeed; the best Season for which is soon after the Leaves begin to decay, that they may take Root before Winter, so that they may be in no Danger of suffering from Drought in the Spring.

These Plants are generally planted in Rows at about 10 Feet asunder, and 4 Distance in the Rows in those Gardens, where the Fruit is cultivated for Sale, but the best Method is to train them against low Espaliers, in which Manner they will take up much less Room in a Garden, and their Fruit will be much fairer.

The Distance they should be placed for an Espalier ought not to be less than 10 or 12 Feet, that their Branches may

may be trained horizontally, which is of great Importance to their Bearing.

Those planted against Pales or Walls should be allowed the same Distance. If they are planted against a South-east Wall or Pale, it will cause their Fruit to ripen at least a Fortnight or three Weeks sooner than those in the borders, and those which are planted against a North Wall or Pale will be proportionably later, so that by this Method the Fruit may be continued a long Time in Perfection, especially if those against the North Pales are matted in the Heat of the Day.

These Plants produce their Fruit upon the former Year's Wood, and also upon small Snags which come out of the old Wood, so that in pruning them, these Snags should be preserved, and the young Shoots shortened in Proportion to their Strength. The best Method of pruning them is, not to lay their Shoots too close, and never to prune their Snags to make them smooth. This, with a small Care in observing the Manner of their Growth, will be sufficient to instruct any Person how to manage this Plant, so as to produce great Quantities of Fruit.

These Plants will thrive and produce Fruit in any Soil or Situation, and are often planted under the Shade of Trees; but the Fruit is always best when they are planted in the open Air, and on light loamy Soil.

RICINOIDES. See *Iatropha*.

RICINUS. *Turn. Inst. R. H. 532. Tab. 307. Lin. Gen. Pl. 962.* [so called, because the Seed resembles (*Ricinus*) the Animal called by that Name, i. e. a Tick which infests Dogs and Oxen. It is also called *Palma Christi*, because its Leaves are said to resemble the Palm of the Hand.] *Palma Christi*, vulgò.

The Characters are,

It hath male and female Flowers disposed in the same Spike. The male Flowers, which are situated on the lower Part of the Spike, have swelling Empalements of one Leaf cut into 3 Parts. These Segments are oval and concave; the Flowers have no Petals, but a great Number of slender Stamina, which are connected in several Bodies, and terminated by roundish Twin Summits. The female Flowers, which are situated on the upper Part of the Spike, have Empalements of one Leaf which are cut into 5 Segments, and armed with Prickles, have no Petals, but in the Center is situated an oval Germen, which is closely shut up in the Empalement, supporting three short Styles, which are bifid, crowned by single Stigmas. The Germen afterward turns to a roundish Fruit, having 3 Furrows, divided into three Cells opening with 3 Valves, each Cell containing one almost oval Seed.

The Species are,

1. **RICINUS foliis peltatis serratis, subtus glaucis, petiolis glanduliferis.** *Ricinus* with Target-shaped sawed Leaves gray on their under Side, and Foot Stalks bearing Glands. *Ricinus vulgaris*. C. B. P. 432. Common *Palma Christi*.

2. **RICINUS foliis peltatis subserratis, lobis amplioribus utrinque virentibus.** *Ricinus* with Target-shaped Leaves somewhat sawed, whose Lobes are large and green on both Sides. *Ricinus Americanus major*. C. B. P. 432. Great American *Palma Christi*.

3. **RICINUS foliis peltatis inaequaliter serratis, capsulis bispidis.** *Tab. 219.* *Ricinus* with Target-shaped Leaves

unequally sawed, and prickly Capsules to the Fruit. *Ricinus Americanus major, caule virecente.* H. R. Par. Greater American *Palma Christi* with a greenish Stalk.

4. **RICINUS foliis peltatis serratis, capsulis rugosis non echinatis.** *Tab. 220.* *Palma Christi* with Target-shaped sawed Leaves, and rough Capsules to the Fruit, which are not prickly.

5. **RICINUS foliis peltatis serratis, lobis maximis, caule geniculato, capsulis echinatis.** *Ricinus* with Target-shaped sawed Leaves having the largest Lobes, a jointed Stalk, and prickly Covers to the Seeds. *Ricinus Africanus maximus, caule geniculato rutilante.* H. R. Par. Greatest African *Palma Christi* with a reddish jointed Stalk.

6. **RICINUS foliis peltatis serratis, lobis maximis, caule geniculato, capsulis inermis.** *Palma Christi* with sawed Target-shaped Seeds having very large Lobes, a jointed Stalk, and smooth Covers to the Seeds.

7. **RICINUS foliis palmatis serratis, profundius divisis, capsulis echinatis.** *Ricinus* with Hand-shaped sawed Leaves deeply divided, and prickly Covers to the Seeds. *Ricinus Americanus minor.* C. B. P. 432. Small American *Palma Christi*.

8. **RICINUS foliis palmatis serratis, profundius divisis, capsulis inermis.** *Palma Christi* with Hand-shaped sawed Leaves deeply divided, and smooth Covers to the Seeds.

The 1st Sort grows naturally in Sicily, and other warm Parts of Europe. This rises with a strong herbaceous Stalk, to the Height of 10 or 12 Feet; the Joins are at a great Distance from each other; the Stalk and Branches are of a gray Colour; the Leaves are large, and have long Foot Stalks; they are deeply divided into 7 Lobes which are sawed on their Edges, and are gray on their under Side; at the Division of the Lobes is a Sort of Navel, where the Foot Stalk joins the Leaves on their under Side. The Flowers are disposed in long Spikes, which arise at the Division of the Branches; the lower Part of the Spikes are garnished with male Flowers which have swollen Empalements, divided into 3 Parts which open, and shew a great Number of slender Stamina, terminated by whitish Summits, and connected at their Base into several small Bunches. The female Flowers which occupy the upper Part of the Spike, have prickly Empalements which inclose the roundish Germen, upon which sit 3 short Styles, crowned by oblong Stigmas. The Germen afterward becomes an oval Capsule with 3 deep Channels, closely armed with soft Spines, and divided into 3 Cells, each containing a oblong striped Seed.

The 2d Sort grows naturally in the Islands of the West-Indies, where it is called *Arum Castus*, or Oil Tree. This is often confounded with the former, most of the Botanists suppose they are the same Plant; but as I have cultivated both more than 30 Years, in which Time I have never observed either of them vary, I think there can be no Doubt of their being different Plants. This hath brown Stalks which divide into many Branches, which rise 6 or 7 Feet high; the Leaves are broader, and not so deeply divided as those of the former; they are of a deep green on both Sides, and unequally sawed. The Spikes of Flowers are shorter, the Seed Vessels rounder and of a brownish Colour, and the Seeds much less, and of a reddish brown Colour.

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The 3d Sort grows naturally in the *West-Indies*, and is often confounded with the former, but is very different. The Stalk of this Sort is thick, herbaceous, and of a grayish green; the Joints are closer than those of the former Sorts, it rises about 4 Feet high, and divides into 3 or 4 Branches which spread almost horizontally; the Leaves are large, of a deep green on their upper Side, but grayish on their under; they are deeply cut into 6 or 7 Lobes or Segments, unequally sawed on their Edges. The Spikes of Flowers are loose, the Covers of the Capsules green, and closely armed with soft Spines, and the Seeds smaller and lighter coloured than those of the 2d Sort.

The 4th Sort grows naturally in both *Indies*, from whence I have several Times received the Seeds. This rises with an herbaceous Stalk about 4 Feet high; the lower Part is purplish, and the upper of a deep green; the Joints of this are pretty far asunder; the Leaves are of a deep green on their upper Side, but are paler on their under; they are not so deeply divided as some of the other Sorts, and are more regularly sawed, the Spikes of Flowers are large. The male Flowers have more Stamina, and their Summits are yellow; the Capsules are oval and rough, but have no Spines; the Seeds are small, and of a brown Colour.

The 5th Sort grows naturally in *Africa* and both the *Indies*; this rises with a large reddish Stalk to the Height of 10 or 12 Feet, which has many Joints, and divides into several Branches; the Leaves are the largest of any Species yet known, I have measured some of them which were more than two Feet and a Half Diameter; they are of a dark green, and unequally sawed on their Edges, and not so deeply cut as those of some other Sorts. The Spikes of Flowers are large, the Empalement of the Flowers is brown, the Summits on the Stamina of the male Flowers are whitish; the Capsules are large, oval, and closely armed with soft Spines; the Seeds are very large, and beautifully striped.

The 6th Sort grows naturally in the *Spanish West-Indies*, from whence the late Mr. Robert Millar sent me the Seeds. The Plants of this Sort are in every Respect like those of the 5th, but the Capsules which inclose the Seeds are smooth, and this Difference is permanent, therefore may be put down as a distinct Species.

The 7th Sort grows naturally in *Carolina*, and several other Parts of *America*; of this there are two Varieties, if not distinct Species; one of them has a red Stalk, and the other a pale green Stalk; they are distinguished by the Inhabitants of *America*, by the Title of red and white Oil Seed. The Stalks of these seldom rise more than 3 Feet high, they divide at the Top into 2 or 3 Branches; the Leaves are much less than those of the other Sorts, and are deeper divided; their Borders are unequally sawed, and the Segments of the Leaves frequently cut on their Sides. The Spikes of Flowers are smaller and more compact than those of the former Sorts; the Capsules are smaller, rounder, and of a light green, and closely armed with soft Spines; the Seeds are small, and finely striped.

The 8th Sort grows naturally in the *Spanish West-Indies*, and also at the *Cape of Good Hope*. This is a lower Plant than the 7th Sort; the Stalks are of a brownish Colour; the Leaves small, deeply cut, and sawed on

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their Edges; the Spikes of Flowers short, the Capsules smooth, and the Seeds small and finely striped.

There are several other Species which grow naturally in both *Indies*, but have not been examined by any curious Botanist; for I have received Seeds of 3 or 4 Sorts, which appeared to be very different from any of the known Sorts, but the Seeds were too old to grow.

The Sorts here enumerated, I have cultivated several Years, and have always found they have kept their Difference, so that I have no Doubt of their being distinct Species; and unless they are thus tried, there is no Possibility of determining their specific Difference; for when Plants are found growing in different Soils and Situations, they have such different Appearances, as may deceive the most skilful Botanist.

These Plants are generally Annuals in these Countries, though in their native Places of Growth they continue longer; and in *England* they are often preserved through the Winter (especially the first Sort) but young Plants are much preferable to those which are thus preserved, therefore few Persons are at the Trouble to keep them, unless when the Seasons prove so bad that their Seeds do not ripen, whereby the Species might be lost, if the Plants are not preserved through the Winter.

These Plants are propagated by Seeds, which must be sown on a hot Bed in the Spring, and when the Plants come up, they should be each planted into a separate Pot filled with light fresh Earth, and plunged into a fresh hot Bed, observing to water and shade them until they have taken Root; after which they must have a great Share of free Air, when the Season is mild, otherwise they will draw up tall, and be very weak; and as these Plants grow very fast, their Roots will in a short Time fill the Pots; therefore they should be shifted into larger, filled with the like fresh Earth, and toward the latter End of *May*, when the Season is warm, they may be hardened to endure the open Air by Degrees; and then if some of the Plants are shaken out of the Pots, and planted out into a very rich Border, and in dry Weather duly watered, they will grow to a very large Size, particularly the 1st and 5th Sorts, which I have seen upward of 10 Feet high in one Season, and these Plants have produced a great Quantity of Flowers and Seeds; but if you intend to preserve any of the Plants through the Winter, they must not be planted in the full Ground, because after their Roots have been widely extended, there will be no transplanting them with Safety; therefore the best Way is to shift them into larger Pots from Time to Time, as their Roots shall require, placing them in the open Air during the Summer Season in some warm Situation, where they may remain until *October*, when they must be removed into the House with other exotic Plants, observing to water them sparingly in Winter, and to admit the free Air in mild Weather; for they only require to be protected from Frost and cold Winds, so that they will endure the Winter in a warm Green-house, without any Addition of artificial Warmth.

These Plants deserve a Place in every curious Garden for the singular Beauty of their Leaves (notwithstanding their Flowers make no great Appearance,) especially those Sorts which may be propagated every Year

Year from Seeds, because those Persons who have no Green-house to place them into in Winter, may cultivate them as other annual Plants; amongst which these, being placed either in Pots or Borders, afford an agreeable Variety; but it must be observed, as they are large growing Plants, never to place them too near others of less Growth, because they will overbear and destroy them; and those which are planted in Pots, should be allowed Room for their Roots to expand, and must be frequently watered, otherwise they will not grow very large.

The Inhabitants of the *West-Indies* draw an Oil from the Seeds of these Plants, which serves for the Use of their Lamps; and as the Plants come up as Weeds in those warm Countries, they are at no Trouble to cultivate them, but employ their Negroes to collect the Seeds from the Plants which grow naturally, whereby they are furnished with the Oil at a small Expence. This Oil is good to kill Lice in Children's Heads.

The Seeds of the first Sort is the *Cataputia major* of the Shops; these have been formerly given by some Persons to purge watery Humours, which they do both upward and downward with great Violence, so that at present these Seeds are rarely used.

RIPENING OF FRUIT.

The METHOD of producing EARLY FRUITS.

In order to have early Fruit, a Wall should be erected 10 Feet high, and in Length according to the Number of Trees intended for 3 Years forcing; the Method of constructing these Walls, is fully explained under the Article *Wall*.

This being done, a Border may be marked out about 4 Feet wide on the South Side of it, and some Scantlings of Wood, about 4 Inches thick, must be fastened to the Ground in a straight Line on the Outside of the Border, to rest the Glass Lights upon; which Lights are to slope backward to the Wall, to shelter the Fruits as there shall be Occasion.

Bars about 4 Inches wide, cut out of the whole Deal, must be placed between these Glasses; that the Lights may rest on them. There must also be a Door shaped to the Profile of the Frame at each End, that it may be opened at either of the Ends, according as the Wind blows.

The Frame before-mentioned should be made so, that when the first Part has been forced, the Frame may be moved the next Year forward, and the succeeding Year forward again, so that the Trees will be forced every third Year; and having two Years to recover themselves, will continue strong for many Years.

These Trees should be well grown before they are forced, otherwise they will soon be destroyed; and the Fruit produced on grown Trees will be much fairer and better tasted, than on fresh planted Trees.

The Fruit that may be planted in these Frames are;

The Avant, the *Albemarle*, the Early *Newington*, and Brown Nutmeg Peaches.

Mr. *Fairchild's* Early, the *Elruge* and *Newington* Nectarines; the Masculine Apricot; the *May Duke* and *May Cherry*.

As for Grapes, the White and Black Sweet-water.

Gooseberries; the *Dutch White*, the *Dutch Early Green*, and the Walnut Gooseberries.

Currants; the large *Dutch White*, the large *Dutch Red Currants*.

It has been found by Experience, that the Trees will be injured, if the Heat be applied before *January*; and that the Time for applying the Heat for bringing either *Duke* or *May Cherries*, is about the Beginning of that Month, and applying Heat at the same Time would do for Apricots; so that the Masculine Apricot will by the Beginning of *March* be as large as *Duke Cherries*, and will be ripe by the Beginning of *May*.

Cherries thus forced will not hold so well as Apricots, though the former will last, perhaps, for 7 Years in good Plight, but Apricots will thrive and prosper thus many Years.

Fairchild's Early Nectarine commonly ripens about the End of *May*, if forced at the same Time, and the *Brugnon* Nectarine will follow that. As to the forward Sorts of Plums, they ripen about the latter End of *May*.

Gooseberries will produce green Fruit fit for Tarts in *March*, and probably will ripen about the Beginning or Middle of *April* at farthest.

Currants might, by the same Heat that brings Cherries in *April*, be forced to produce ripe Fruit at the same Time, if not sooner.

As for the Distance of these Trees one from another, it need not be so great as is directed for those planted in the open Air, because they will never shoot so vigorously nor last so long, therefore 8 or 9 Feet will be sufficient.

The higher Parts of the Wall being furnished with Apricots, Cherries, Nectarines, Peaches, and Plums, the lower small Space between them may be filled up with Currants, Gooseberries, and Roses.

The Trees against that Part of the Wall which is designed for forcing, should be pruned as soon as their Leaves begin to decay, that the Buds on the Branches which are left may be benefited, by receiving all the Nourishment of the Branches, whereby they will become turgid and strong, by the Time the Walls are heated.

As to the Nailing of these Trees.

Every Branch or Shoot must be laid as close to the Wall as can be; for the Fruit which is near the Wall will be ripe a Month sooner, than those that lie but 4 Inches from it.

Sometimes it happens, that the Tops of such Trees have Blossoms a Month or six Weeks before the Bottom; and sometimes one Branch has been full of Blossoms, when there have been half a Score or more Branches of the same Tree, which have not stirred till the Fruit of the first Blossoms has been almost grown, notwithstanding which the Tree, has done very well; and it is no uncommon Thing for such Trees to have Fruit ripening upon them for near three Months continually.

As for Gooseberries; those Plants which are planted in these Frames, should be such as have spread; and when as many Shoots have been nailed to the Wall as may conveniently be done, others may be left at a Distance from it, to succeed them in ripening.

If they are taken up in Autumn, and properly managed, they will bear Fruit the first Year, as well as if they

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they had not been transplanted, but these seldom last longer than one Year.

The Currants may be ordered after the same Manner, and also the Roses; and the best Kind of Rose for this Purpose, is the Monthly Rose, which ought always to be topped about the End of *July* or Beginning of *August*, to make them put out a good Number of Flower Buds.

As to the laying the Dung to the Wall:

The Dung, before it be laid to the Back of the Wall, should be thrown up in a Heap, and lie for some Days, then turned over that it may yield an equal Heat every where, and be constant.

When it has been thus prepared, it should be laid about 4 Feet thick at the Base, and so sloping, till it has but two Feet wide at the Top.

It should be laid at first within 4 Inches of the Top of the Wall, for it will sink 2 Feet in six Weeks Time; and then some fresh Dung must be laid, because the first Heat will only swell the Buds of the Trees, or bring them to flower.

But, according as the Frosts shall have happened to have had more or less Influence over the Buds, this will happen sooner or later.

If these Trees be covered with the Glasses a Month before the Dung is laid against the Wall, it will contribute very much to forward their blossoming; for though their Blossoms will not be destroyed by the Frosts, yet the more the Frosts come at them, they will both be the drier and more hard to open.

If the Weather be tolerably mild, the Trees ought not to be hindered from the Benefit of the Showers till the Buds begin to stir; but afterwards the Glasses should be kept constantly over them, till the Influence of the Sun is something considerable.

But the Doors which are at each End of the Frame, should in the mean Time be set open, when the Wind does not blow too sharp, and the Sun shines any Thing warm; and if this does not happen in the Space of a Fortnight, then the Doors at both Ends may be opened, and Mats of Bafs or Canvass should be hung up over the Door Ways to correct the Winds, and give the Air Leave to circulate in the Frames.

As for Cherries; about three Changes of Dung will be sufficient to bring them to a due Ripeness in *April*, supposing each Parcel remains a Month at the Back of the Wall.

But as for Apricots, Grapes, Nectarines, Peaches, and Plums, if *April* proves cold, the forcing Heat must be continued till *May* is settled; but some of the Glasses should be opened in the Morning in *March* and *April*, when the Wind is still and the Sun warm; and they should be permitted to receive the Showers that fall, while the Fruit is growing; but while they are in blossom, no Rain should come near them, because, if there should be any Moisture lodged in the Bosom of the Flowers, and the Sun shine hot through the Glasses, it would be apt to destroy them.

The Dung that comes from these Frames, having lost its Heat, may be laid in Heaps to rot for the meliorating of stubborn Grounds; or if thrown in Heaps and mixed with new Dung, it will ferment again, and may be used for hot Beds.

Another Thing which ought to be observed in plant-

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ing Fruit in these Frames is, to plant those Fruits which come forward together, and those which come late by themselves, because it will be prejudicial to the forward Fruit, to give them any more Heat when they have done bearing, when at the same Time the latter Fruits set amongst them may require more Heat, and to be continued longer, some of them, perhaps, requiring an artificial Heat till *May*.

There may also a Row or two of scarlet Strawberries be planted near the Back of this Frame, which you may expect will be ripe by the End of *March*, or Beginning of *April*.

As for the Vines, they may probably be brought to blossom in *April*, and have ripe Grapes in *June*.

There may also be here and there planted a monthly Rose Tree, and Hyacinths, Jonquils, Narcissuses, Poyanthuses, also early Tulips might be planted in the Borders.

The Method of forcing of Fruit Trees by the Help of Fire Walls, is fully treated under the Article *Walls*.

RIVINIA. *Plum. Nov. Gen. 48. Tab. 39.*

The Characters are,

The Empalement of the Flower is permanent, and composed of 4 oval, concave, coloured Leaves. The Flower has no Petals, it has 8 Stamina, longer than the Empalement, terminated by small oval Summits, and a large roundish Germen supporting a short Style, crowned by an obtuse Stigma. The Germen afterward turns to a roundish Berry sitting in the Empalement, including one hard Seed.

The Species are,

1. RIVINIA *foliis lanceolatis petiolatis integerrimis, caule fruticoso ramosa*. Rivinia with Spear-shaped entire Leaves having Foot Stalks, and a shrubby branching Stalk. Rivinia *humilis racemosa, baccis puniceis*. *Plum. Nov. Gen. 48.* Dwarf branching Rivinia with scarlet-coloured Berries, sometimes called Currant Tree.

2. RIVINIA *scandens racemosa, amplis solani foliis, baccis violaceis*. *Plum. Nov. Gen. 48.* Climbing branching Rivinia, with Nightshade Leaves, and Violet-coloured Berries, commonly called Hoopwith in the *West-Indies*.

The 1st Sort rises with shrubby Stalks about 4 Feet high, dividing into several spreading Branches, covered with a gray spotted Bark, and garnished with Spear-shaped entire Leaves standing on long slender Foot Stalks; these are 2 Inches and a Half long, and one broad in the Middle, drawing to a Point at each End; they are smooth, of a lucid green, and pretty thick Consistence, standing alternate, at pretty great Distances on the Branches. The Flowers are produced in long Bunches from the Side and at the End of the Branches, each standing on a slender Foot Stalk near half an Inch long; these have no Petals, but their Empalements are of a scarlet Colour; within these are situated 8 Stamina, longer than the Empalement, terminated by small oval Summits; in the Center is situated a roundish Germen, terminating in a Point, supporting a short Style. The Germen turns to a roundish Berry with a thin Pulp, surrounding one roundish hard Seed; these Berries are of a scarlet Colour when ripe, and afterward change to a purple; they are by the Inhabitants called Currants, but are generally esteemed poisonous.

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The 2d Sort rises with a climbing woody Stalk of 20 Feet High, covered with a dark gray Bark, and garnished with oval Spear-shaped Leaves, near 3 Inches long, and an Inch and a Half broad, standing on short Foot Stalks; they are smooth and entire. The Flowers come out in long Bunches from the Side of the Branches, and are shaped like those of the other, and are succeeded by blue Berries about the same Size as those of the former. This Sort grows naturally in Antigua, from whence I have received the Seeds; it was also found growing at the Havannab, by the late Dr. Houftoun, who found the 1st growing in Jamaica.

They are both propagated by Seeds, which remain long in the Ground before they vegetate; I have had them lie 2 Years before the Plants have appeared, but they never rise the same Year the Seeds are sown.

These Berries must be procured from the Countries where they naturally grow, and when they arrive, should be sown in Pots filled with fresh Earth, and plunged into a moderate hot Bed. If this happens late in Autumn, or in Winter, the Pots must be plunged into the Tan Bed of the Stove, but if in the Spring, they may be plunged in a common hot Bed under a Frame. The Earth must be moistened frequently in Summer to promote the Vegetation of the Seeds, but as they will not come up the same Year, so the Pots should be removed into the Stove before Winter, and plunged into the Tan Bed; during the Winter Season, the Earth must be sometimes refreshed, but must not be too moist. In Spring the Pots may be taken out of the Stove, and plunged into a fresh hot Bed to bring up the Plants; but if they should not then rise, the Earth must not be disturbed, because the Plants may come up the following Season.

When the Plants come up and are fit to remove, they should be each transplanted into a separate small Pot, filled with light loamy Earth, and plunged into a hot Bed, observing to shade them from the Sun till they have taken new Root; after which they must be treated as other Plants from the same Countries.

These Plants are tender, so cannot be preserved in this Country, unless kept in a warm Stove, especially while they are young; but when they have obtained Strength, they will live in a moderate Warmth in Winter, and in Summer may be removed into the open Air, placing them in a sheltered Situation, where they may remain for near 3 Months in the warmest Part of Summer: During the Winter Season, they should be sparingly watered, for as they grow naturally on a dry Soil, so much Wet will destroy them, especially in cold Weather.

They retain their Leaves all the Year, so make a Variety in the Stove in Winter, and when they flower, make a fine Appearance, though their Flowers are but small; for as they are produced in long Bunches, from almost every Joint toward the End of the Branches, the whole Plant is well adorned during their Continuance; and if they do produce Fruit, as that will remain long before it is ripe, so their Beauty will be of longer Duration.

ROBINIA. Lin. Gen. Pl. 775. *Pseudoacacia*. Tourn. Inst. R. H. 649. Tab. 417. False Acacia.

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The Characters are,

The Empalement of the Flower is small, of 1 Leaf and divided into 4 Parts, the 3 under Segments being narrow, but the upper one broad. The Flower is of the Pea Bloom Kind: The Standard is large, roundish, obtuse, and spreads open. The 2 Wings are oval, and have short Appendixes which are obtuse. The Keel is roundish, compressed, obtuse, and extended the Length of the Wings. In the Center is situated 10 Stamina, 9 of them being joined together, and the other standing single, terminated by roundish Summits. It hath an oblong cylindrical Germen, supporting a slender Style, crowned by a hairy Stigma; these are inclosed by the Keel. The Germen afterward becomes an oblong compressed Pod, inclosing Kidney-shaped Seeds.

The Species are,

1. ROBINIA *pedunculis racemosis, foliis impari-pinnatis*. Hort. Upsal. 212 Robinia with Foot Stalks supporting long Bunches of Flowers, and unequal winged Leaves. *Pseudoacacia vulgaris*. Tourn. Inst. R. H. 649. Common Bastard Acacia, or American Acacia, called in America Locust Tree.

2. ROBINIA *pedunculis racemosis, foliis impari-pinnatis, leguminibus echinatis*. Robinia with Foot Stalks supporting long Bunches of Flowers, unequal winged Leaves, and prickly Pods. *Pseudoacacia Americana, siliquis echinatis*. Boerb. Ind. alt. 11. 39. American Acacia with prickly Pods.

3. ROBINIA *foliis impari-pinnatis, foliolis ovatis, ramis pedunculisque hispida*. Robinia with unequal winged Leaves having oval Lobes, and the Branches and Foot Stalks of the Flowers armed with stinging Spines. *Pseudoacacia hispida, floribus roseis*. Cateb. Car. 3. p. 20. Stinging false Acacia, with a Rose-coloured Flower.

4. ROBINIA *foliis impari-pinnatis, foliolis ovatis acuminatis, ramis nodosis glabris, pedunculis racemosis*. Robinia with unequal winged Leaves, whose Lobes are oval and acute-pointed, knobbed smooth Branches, and Flowers growing in long Bunches. *Pseudoacacia flore roseo*. Plum. Cat. Bastard Acacia with a Rose-coloured Flower.

5. ROBINIA *foliis impari-pinnatis, foliolis oblongo-ovatis, pedunculis racemosis confertis*. Robinia with unequal winged Leaves having oblong oval Lobes, and Foot Stalks with long Bunches of Flowers growing in Clusters. *Pseudoacacia arborea floribus racemosis, siliquis compressis glabris*. Houst. Mss. Tree-like Bastard Acacia, with Flowers growing in long Bunches, and flat smooth Pods.

6. ROBINIA *foliis impari-pinnatis, foliolis obversis-ovatis, racemis aggregatis axillaribus, leguminibus membranaceo-tetragonis*. Robinia with unequal winged Leaves, whose Lobes are obversely oval, long Bunches of Flowers growing in Clusters from the Sides of the Branches, and Pods having four-winged Membranes. *Pseudoacacia siliquis alatis*. Plum. Cat. 19. False Acacia with winged Pods. Linnaeus titles it *Erythrina foliis pinnatis, leguminibus membranaceo tetragonis*. Sp. Plant. 707. Coral Tree with winged Leaves and Pods, having four membranaceous Wings.

7. ROBINIA *foliis duplicato-pinnatis, foliolis ovatis sessilibus, floribus spicatis terminalibus*. Robinia with doubly-winged Leaves, whose Lobes are oval and sit close to the

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the Mid-rib, and Spikes of Flowers terminating the Branches. *Pseudoacacia flore pyramidato coccinea. Plum. Cat. 19.* False Acacia with a scarlet-coloured pyramidal Flower.

8. *ROBINIA foliis pinnatis, foliolis lanceolatis oppositis, racemis axillaribus pedunculis longioribus. Robinia* with winged Leaves having Spear-shaped Lobes placed opposite, and long Bunches of Flowers on the Sides of the Branches, and longer Foot Stalks. *Pseudoacacia fraxini folio, floribus violaceis. Plum. Cat. 19.* False Acacia with an Ash Leaf and Violet coloured Flowers.

9. *ROBINIA foliis impari pinnatis, foliolis oblongis acuminatis, racemis axillaribus, leguminibus oblongo-ovatis. Robinia* with unequal winged Leaves, having oblong acute pointed Lobes, and Bunches of Flowers proceeding from the Sides of the Branches. *Pseudoacacia latifolia, siliquis latis. Houst.* False Acacia with broad Leaves and Pods.

10. *ROBINIA pedunculis simplicibus, foliis quaternatis petiolatis. Hort. Ups. 212.* Robinia with single Foot Stalks, and Leaves growing by Fours upon Foot Stalks. *Aspalathus frutescens major latifolius, cortice aureo. Am. Rutb. 283.* Greater broad-leaved shrubby *Aspalathus*, with a golden Bark.

The 1st Sort is the common Acacia, which is a Native of North America; the Seeds of this were first brought to Paris from Canada by Monsr. Robine, and soon after from Virginia to England, and the Trees raised in several Gardens, which for some Years, while young, were in great Esteem; but as they grew larger, their Branches were frequently broken by strong Winds in the Summer, which rendered them unsightly, so that for several Years they were seldom planted in Gardens; but of late it is become fashionable again, and great Numbers of them have been raised in most Parts of England, and there are few Gardens in which there are not some of them.

This Sort grows to a very large Size in America, where the Wood is much valued for its Duration; most of the Houses which were built at Boston in New England, upon the first Settling of the English, was with this Timber, which continues very sound at this Time.

It grows very fast while young, so that in 2 or 3 Years from Seed, the Plants are 8 or 10 Feet high; and it is not uncommon to see Shoots of this Tree, 6 or 8 Feet long in one Summer. The Branches are armed with strong crooked Thorns, and garnished with winged Leaves composed of 8 or 10 Pair of oval Lobes, terminated by an odd one; they are of a bright green, entire, and sit close to the Mid-rib. The Flowers come out from the Side of the Branches in pretty long Bunches, hanging downward like those of *Laburnum*, each Flower standing on a slender Foot Stalk. They are of the Butterfly or Pea Blossom Kind, are white, and smell very sweet. They appear in June, and when the Trees are well charged with Flowers, make a fine Appearance, and their Odour perfumes the circumambient Air; but they are of short Duration, seldom continuing more than one Week in Beauty; after the Flowers fade, the Germina become oblong compressed Pods, which in warm Seasons come to Perfection in England; these ripen pretty late in the Autumn.

The Leaves of this Tree do not come out till late in

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the Spring, and fall off pretty early in the Autumn, which renders it less valuable than it would otherwise be, were the Leaves to come out early in Spring.

The 2d Sort is less common than the 1st. There was a large Tree of this Kind some Years, growing in the Garden of the Bishop of London at Fulham, which produced Plenty of Seeds. The Pods of this Sort are much shorter, and closely beset with short Prickles, but in other Respects agrees with the 1st Sort.

The 3d Sort grows naturally in Carolina, where it sometimes rises 20 Feet High, but in England at present it seems to be of low Growth; the Branches spread out near the Ground, and produce their Flowers very young, which is a sure Sign of its not growing tall here. The Branches of this Tree, and also the Foot Stalks of the Flowers, are closely armed with small brown Spines, like some Sorts of Roses; the Leaves are like those of the first Sort, but their Lobes are larger and rounder. The Flowers come out in Bunches like those of the former, but are larger and of a deep Rose Colour. It flowers about the same Time with the 1st, but has not as yet produced any Pods in England.

The 4th Sort grows naturally at Campeachy, from whence the late Dr. Houstoun sent the Seeds. This rises with a strong woody Stem, 30 or 40 Feet High, sending out many strong Branches on every Side, which have large swelling Knots, and are closely garnished with single winged Leaves composed of 8 or 9 Pair of oval Lobes ending in Points, terminated by an odd one; these are curiously marked with purple Spots on their under Side, which appear faintly on their upper. The Flowers are produced in long close Spikes, standing almost erect; they are about half the Size of the Flowers of the last Sort, and are of a fine Rose Colour.

The 5th Sort was found growing at Campeachy by the late Dr. Houstoun; this rises with a woody branching Stalk 12 or 14 Feet high; the old Branches are covered with a dark brown Bark, but the young Shoots and the Foot Stalks of the Flowers are covered with an Iron-coloured Down; the Leaves are unequally winged, the Lobes oblong, obtuse, and of a pretty thick Consistence; they are smooth on their upper Side, but have several transverse Veins on their under. The Flowers are produced at the End of the Branches in long close Bunches, there are 6 or 7 of them gathered together in Clusters. The Flowers are but small, and of a yellowish red Colour; the Pods of this are like those of the 1st Sort.

The 6th Sort grows naturally in Jamaica, where the Inhabitants give it the Appellation of Dogwood. This hath a strong woody Stem, which rises 40 Feet high, and divides into many Branches, covered with a dark brown spotted Bark, and garnished with unequal winged Leaves, composed of 3 or 4 Pair of obverse oval Lobes, terminated by an odd one; they are 2 Inches and a Half over, smooth on their upper Side, but veined on their under, which are of a Buff Colour.

The Flowers come out in branching Bunches from the Side of the Branches; these generally appear at a Time when the Trees are destitute of Leaves, and as they have large Clusters of Flowers at every Joint, the Trees seem covered with them. The Bunches at the Extremity of the Branches are the largest, and are pyramidal.

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The Flowers are but small, and do not open so fully as those of the 1st Sort, but are of a pale Rose Colour, so make a fine Appearance; they are succeeded by Pods, having 4 broad membranaceous Wings running longitudinally at the 4 Corners of the Pods, and these join at their Base, covering the Pods entirely; each of the Pods contain 4 or 5 oblong Kidney-shaped Seeds.

The 7th Sort was discovered by *Plumier*, in some of the *French Settlements* of the *West-Indies*, and was found by the late *Dr. Houstoun* growing at *Campeachy*. This rises with a strong woody Stem near 30 Feet high, sending out many spreading Branches, covered with a light gray Bark, spotted with white, and garnished with double winged Leaves, whose Lobes are oval and sit close to the Mid-rib; they are of a lucid green on their upper Side, but of a pale green on their under. The Flowers are produced in long loose pyramidal Bunches toward the End of the Branches, those on the lower Part of the Bunch having long Foot Stalks, which diminish gradually to the Top, so as to form a Pyramid; these Bunches are almost erect. The Flowers are of a scarlet Colour, so make a fine Appearance.

The 8th Sort was found growing naturally at *Campeachy*; this rises with a woody Stem to the Height of 20 Feet, dividing at the Top into several spreading Branches, covered with a very light gray Bark, and garnished with equal winged Leaves, composed of 10 or 11 Pair of oval Lobes placed opposite; they are of a lucid green on the lower Part of the Branches, but those toward the End are covered with a soft Iron-coloured Down. The Flowers come out in long Bunches from the Side of the Branches, they are blue, and stand on long Foot Stalks; they are succeeded by Pods shaped like those of the 1st Sort, but are downy.

The 9th Sort was discovered by the late *Dr. Houstoun*, at *Campeachy*. This Sort rises with a strong woody Stem upward of 30 Feet high, dividing at the Top into many strong Branches, covered with a dark grayish Bark, spotted with white, and are garnished with winged Leaves, composed of 6 or 7 Pair of Lobes, terminated by an odd one; they are 2 Inches and a Half long, and an Inch and a Half broad, ending in a Point, of a lucid green on their upper Side, but pale on their under. The Flowers are produced in long loose Bunches from the Side of the Branches, they are of a pale Rose Colour, and have very long Foot Stalks; these are succeeded by oval Pods, two Inches and a Half long, and one and a Half broad, swelling in the Middle, where is lodged one or two Kidney-shaped Seeds.

The 10th Sort grows naturally in *Siberia* and *Tartary*; this grows with a shrubby Stalk 8 or 10 Feet high, sending out several Branches which grow erect, and are covered with a smooth yellowish Bark; the Leaves have each two Pair of oval pointed Lobes, which stand on short Foot Stalks. The Flowers are produced on single Foot Stalks, which come out at the Joints of the Branches; they are yellow, and shaped like those of the *Laburnum*, but smaller; these appear in *May*, and if the Plants stand in a moist Soil and shady Situation, their Pods will succeed the Flowers, and the Seeds will ripen the End of *August*.

The 1st Sort is generally propagated in the *English Nurseries*, by Suckers taken from the Roots of the old

Trees, or by cutting off some of the Roots and planting them on a gentle hot Bed; these will put out Shoots, and become Plants; but they are not so valuable as those raised from Seeds, because they do not make near so great Progress in their Growth, and are very subject to send forth many Suckers from their Roots, whereby the Ground will be filled with them to a great Distance; and these Suckers will draw away the Nourishment from the old Plants, whereby their Growth will be greatly retarded.

If this is propagated by Seeds, they should be sown on a Bed of light Earth, about the latter End of *March* or Beginning of *April*; and if the Bed is well exposed to the Sun, the Plants will appear in about 5 or 6 Weeks, and will require no farther Care but to keep them clear from Weeds. In this Bed the Plants may remain till the following Spring, when they should be transplanted into a Nursery about the latter End of *March*, placing them in Rows at 3 Feet Distance Row from Row, and a Foot and a Half asunder in the Rows. In this Nursery they may remain 2 Years, by which Time they will be fit to transplant where they are designed to grow; for as these Trees send forth long tough Roots, if they stand long unremoved, the Roots will extend themselves to a great Distance; therefore they must be cut off when the Plants are transplanted, which sometimes occasions their miscarrying.

These Trees will grow well upon almost every Soil, but best in a light sandy Ground, in which they will shoot 6 or 8 Feet in one Year; and while the Trees are young, they make an agreeable Appearance, being well furnished with Leaves; but when they are old and decaying, the Branches being frequently broken by Winds, they become very unsightly, which occasioned their being rooted out of several Gardens some Years past. This is commonly known by the Title of Locust Tree in *America*, and there are Quantities of the Seeds annually sent to *England* with that Title.

The 2d Sort is propagated in the same Manner as the 1st, and the Trees grow to the same Size.

The 3d Sort is at present scarce in the Gardens about *London*, but in *Devonshire* it is in greater Plenty, where the Inhabitants give it the Title of Raspberry Plant, from the young Shoots being covered with bristly Hairs like the Raspberry; this does not produce Seeds in *England*, so is propagated by cutting off Part of the Roots, and planting them on a gentle hot Bed, where they will put out Fibres and Shoots, and become new Plants. This Sort should have a warmer Situation than the two former, though the ordinary Winters in this Country never injure it, but in very severe Winters their young Shoots are sometimes killed in exposed Places. It loves a light moist Soil.

The 4th, 5th, 6th, 7th, 8th, and 9th Sorts, are tender, so cannot be maintained in *England*, unless placed in a Stove in Winter. These are propagated by Seeds, which must be procured from the Countries where they naturally grow, for they do not produce any here; these should be sown in small Pots filled with Earth from the Kitchen Garden, and plunged into a hot Bed of Tanners Bark; if the Seeds are good, the Plants will appear in six Weeks or two Months; when fit to transplant, they should be carefully shaken out of the Pots, and their Roots separated

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rated; then each Plant put into a small Pot, filled with the like Earth, and plunged into a hot Bed of Tanners Bark, observing to shade them till they have taken new Root, and then they must have the same Treatment as other tender Plants from the same Countries.

While the Plants are young, they are more tender than afterward, therefore it will be proper to keep them in the Tan Bed in the Stove the two first Years, but when they have obtained Strength, they may be kept in a dry Stove of a temperate Heat in Winter, and in the Summer may be exposed to the open Air in a sheltered Situation; with this Management I have kept several of the Species, some of which have produced Flowers in the Chelsea Garden, and some of the Sorts I have propagated by Cuttings.

The 10th Sort is propagated by Seeds, which should be sown in a shady Situation in Autumn, and the Plants will come up the following Spring; but if the Seeds are sown in Spring, they seldom rise the same Season. When the Plants come up, they require no Care, but to keep them clean from Weeds till Autumn, when, if they have made any Progress, they should be transplanted on a North Border, at about six Inches Distance, where they may grow two Years, and then should be planted where they are to remain, which should be in a cool moist Soil.

ROCKET see *Eruca*, *Bunias*, *Hesperis*, *Sisymbrium*.

RONDELETIA. *Plum. Nov. Gen.* 15. *Tab.* 12. *Lin. Gen. Pl.* 206.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, sitting upon the Germen, cut into 5 acute Points. It has 1 Funnel-shaped Petal, with a cylindrical Tube longer than the Empalement, bellied toward the Top, and cut into 5 roundish Segments at the Brim, which are reflexed. It has 5 short Awl shaped Stamina, terminated by single Stamina; the roundish Germen is situated under the Flower, supporting a slender Style the Length of the Tube, crowned by an obtuse Stigma. The Germen afterward becomes a roundish crowned Capsule with 2 Cells, inclosing 2 or 3 angular Seeds in each.

The Species are,

1. RONDELETIA *foliis sessilibus*. *Lin. Sp. Pl.* 172. *Rondeletia* with Leaves sitting close to the Branches. *Rondeletia arborescens, tini facie*. *Plum. Nov. Gen.* 15. Tree-like *Rondeletia* having the Appearance of *Tinus*.

2. RONDELETIA *foliis petiolatis*. *Flor. Zeyl.* 80. *Rondeletia* with Leaves growing upon Foot Stalks. This is the *Cupi*. *Hort. Mal.* 2. p. 37.

The 1st Sort grows naturally in the West-Indies, where Plumier discovered it, and gave it this Title in Honour of *Gulielmus Rondeletius*, a famous Physician and natural Historian of *Montpelier*.

The Seeds of this Plant were sent me by Mr. Robert Millar, who collected them on the North Side of *Jamaica*; he also observed the Trees growing plentifully in the Spanish West-Indies, I have since received the Seeds from *Barbadoes*, which have succeeded at *Chelsea*. This rises with a woody Stalk 10 or 12 Feet high, branching out on every Side; the Branches are covered with a smooth greenish Bark, and garnished with oblong Leaves ending in acute Points; they are entire, and sit very close to the Branches; their upper Surface is of a

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lucid green, and the under of a pale green; they are a little crumpled on their Surface and stand alternate. The Flowers come out in Bunches at the End of the Branches, they are white and have little Scent. These appear in Autumn, and are not succeeded by Seeds in *England*.

The 2d Sort grows naturally in *Ma'abar*; this rises with a woody Stalk 6 or 7 Feet high, dividing into several Branches, covered with a smooth Bark, and garnished with stiff oblong oval Leaves, of a lucid green, standing alternate on the lower Part of the Branches, but by Pairs toward the Extremity; they have short Foot Stalks, and are entire. The Flowers are produced in large Bunches at the End of the Branches, they are of a yellowish white Colour, and have a fragrant Odour: These are succeeded by roundish Capsules having two Cells, each containing 3 or 4 angular Seeds.

These Plants being very tender, cannot be preserved in *England*, unless kept in a warm Stove. They are propagated by Seeds, which should be sown on a hot Bed early in Spring; and when the Plants are come up and fit to remove, they must be transplanted into separate small Pots, and plunged into a moderate hot Bed of Tanners Bark, where they must be treated as other tender Plants from the same Country; in Winter they must be placed in the Tan Bed in the Stove, where they will thrive and in two or three Years, flower, when they will make an agreeable Variety among other tender exotics for they retain their Leaves all the Year; and those of the 2d Sort being of a lively green, make a fine Appearance at all Seasons.

ROOT, in Latin *Radix*.

A Root is that Part of a Plant, by which it naturally draws in its Nourishment. The Roots of Plants being of various Forms, and each distinguished by a different Name, it will not be improper, in this Place, to insert the principal of those which are thus distinguished. And first,

A fibrous Root, *Radix fibrosa*, consists wholly of small Fibres, as most Sorts of Grasses, Pinks, &c.

A tuberous Root, *Radix tuberosa*, consists of an uniform fleshy Substance, and is of a roundish Figure, as Turnips, Potatoes, &c.

A bulbous Root, *Radix bulbosa*, consists either of several Coats involving one another, as Onions, Tulips, &c. or of several Scales lying over one another, as Lillies, Crown Imperials, &c. The first of these is called a tunicated Root, the last a squamous Root.

A testiculated Root, *Radix testiculata*, is a double tuberose Root, for it consists of two Knobs, resembling a Pair of Testicles, as in the Orchis.

A handed Root, *Radix palmata*, is a tuberose Root divided as it were, into several Fingers, as in the handed *Satyrions*.

A grumous Root, *Radix grumosa*, is that which is composed of several Knobs, as the *Anemone*, &c.

A granulous Root, *Radix granulata*, is a Kind of grumous Root with small Knobs resembling so many Grains of Corn, as in the white *Saxifrage*.

A Tap Root is a tuberose Root extended in Length, as in *Parsnips*, *Carrots*, &c.

ROSA. *Tourn. Inst. R. H.* 636. *Tab.* 408. *Lin. Gen. Pl.* 556. The Rose Tree.

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The Characters are,

The Empalement of the Flower is of one Leaf divided into 5 Parts at Top, but the Base is globular and Bell-shaped. The Segments are Spear-shaped, 2 of these alternately have Appendixes on their Sides, 2 other alternately are naked, and the 5th has often an Appendix, and sometimes none. The Flower hath 5 oval Heart-shaped Petals inserted in the Empalement, and a great Number of short Hair-like Stamina, inserted in the Neck of the Empalement, terminated by three cornered Summits. It hath many Germina situated in the Bottom of the Empalement, each having a short hairy Style, inserted to the Side, crowned by obtuse Stigmas. The fleshy Base of the Empalement afterward becomes a Top-shaped coloured Fruit with one Cell, including many hairy oblong Seeds fastened on each Side to the Empalement.

The Species are,

1. *ROSA caule aculeato, petiolis inermibus, calycibus semipinnatis.* Flor. Suec. 406. Rose with a prickly Stalk, unarmed Foot Stalks, and Empalements half-winged. *Rosa sylvestris vulgaris flore odorato incarnato.* C. B. P. 483. Common wild Rose with a Flesh-colour sweet Flower commonly called Wild Briar, Dog Rose, or Hep Tree.

2. *ROSA caule petiolisque aculeatis, calycis foliolis indivisis.* Flor. Suec. 407. Rose with Stalks and Foot Stalks armed with Spines, and the small Leaves of the Empalement undivided. *Rosa campestris spinosissima, flore albo odorato.* C. B. P. 483. Wild prickly Rose with a white Sweet Flower, commonly called the Burnet leaved Rose.

3. *ROSA foliis utrinque villosis fructu spinoso.* Haller. Helvet. 350. Rose whose Leaves are hairy on both Sides, and the Fruit prickly. This is the *Rosa sylvestris pomifera major.* C. B. P. 484. The greater wild Apple-bearing Rose.

4. *ROSA aculeata, foliis odoratis, subtus rubiginosis.* Haller. Helvet. 350. Rose with Spines and sweet-scented Leaves which are rusty on their under Side. *Rosa sylvestris, foliis odoratis.* C. B. P. 483. Wild Rose with sweet-scented Leaves, commonly called Sweet Briar.

5. *ROSA caule petiolisque aculeatis, foliis pinnatis, foliolis apice incis, fructu globoso.* Rose with the Stalk and Foot Stalk armed with Spines, winged Leaves whose Lobes are cut at their Points, and a globular Fruit. *Rosa pimpinella minor Scotica, flore livido rubente.* Edit. prior. Small, Scotch, Burnet-leaved Rose with a livid red Leaf.

6. *ROSA caule inermi, pedunculis hispida, calycis foliolis indivisis, fructibus oblongis.* Rose with a smooth Stalk, a prickly Foot Stalk to the Flower, the small Leaves of the Empalement undivided, and oblong Fruit. *Rosa campestris, spinis carens, hispida.* C. B. P. 484. Unarmed Rose having two Flowers.

7. *ROSA foliis utrinque villosis, calycis foliolis acutis serratis, fructu glabro.* Rose with Leaves hairy on both Sides, the small Leaves of the Empalement sharply sawed, and a smooth Fruit.

8. *ROSA caule aculeato scandente, foliolis glabris serratis perennantibus.* Rose with a prickly climbing Stalk, and, smooth, sawed, ever-green Leaves. *Rosa sylvestris dumetorum scandens sempervirens, myrti folio lucido, flore albo odorato, fructu parvo rotundo & hispido.* Michx. Cat. Pl. Ag. Flor. Wild, woody, climbing Rose with a shining ever-green Myrtle Leaf, a white sweet-scented Flower, and a small, round, prickly Fruit.

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9. *ROSA caule aculeato, foliolis quinis glabris perennantibus.* Lin. Sp. Pl. 482. Rose with a prickly Stalk, and 5 smooth Lobes to the Leaves which are ever-green. *Rosa moschata sempervirens.* C. B. P. 482. Ever-green Musk Rose.

10. *ROSA inermis, foliis pinna'tis serratis utrinque glabris, calycis foliolis indivisis.* Rose without Thorns, having winged Leaves smooth on both Sides, and the Leaves of the Empalement undivided. *Rosa sylvestris Virginiana pimpinellæ majoris foliis.* Raii Hist. Wild Virginia Rose with greater Burnet Leaves.

11. *ROSA caule aculeato, foliis pinnatis, foliolis ovatis serratis utrinque glabris, pedunculis brevissimis.* Rose with a prickly Stalk, winged Leaves having oval sawed Lobes smooth on both Sides, and short Foot Stalks to the Flower. *Rosa lutea simplex.* C. B. P. 483. The single yellow Rose.

12. *ROSA caule aculeato, foliis pinnatis, foliolis rotundioribus serratis, petalis emarginatis bicoloribus.* Rose with a prickly Stalk, winged Leaves having rounder sawed Lobes, the Petals of the Flower indented at Top, and of two Colours. *Rosa punicea.* Corn. Can. 11. The Austrian Rose.

13. *ROSA caule aculeato scandente, foliis senis glabris, floribus unbellatis.* Rose with a prickly climbing Stalk, Leaves having 7 smooth Lobes, and Flowers growing in Umbels. *Rosa moschata major.* J. B. 2. p. 45. Greater Musk Rose.

14. *ROSA caule aculeato, pedunculis hispida calycibus semipinnatis glabris.* Lin. Sp. Plant. 491. Rose with a prickly Stalk, bristly Foot Stalks, and smooth half-winged Empalements. *Rosa centifolia Batavica.* Clus. Hist. 1. p. 114. The Dutch hundred-leaved Rose.

15. *ROSA caule aculeato, pedunculis hispida, calycibus pinnatifidis birsutis.* Rose with a prickly Stalk, bristly Foot Stalks to the Flowers, and Wing pointed hairy Empalements. *Rosa Damascena.* Lob. Icon. 206. Damask Rose.

16. *ROSA caule aculeato, pedunculis lævibus, calycibus semipinnatis glabris.* Lin. Sp. P. 492. Rose with a prickly Stalk, smooth Foot Stalks to the Flowers, and smooth half-winged Empalements. *Rosa alba vulgaris major.* C. B. P. 482. Common great white Rose.

17. *ROSA caule aculeato, foliis subtus birsutis, calycibus semipinnatis villosis.* Rose with a prickly Stalk, Leaves hairy on their under Side, and half-winged hairy Empalements to the Flowers. *Rosa Belgica frœ vitrea flore rubicante.* Rea. Flor. The Blush Belgick Rose.

18. *ROSA caule petiolisque aculeatis, foliis subtus villosis, calycibus semipinnatis hispida.* Rose with prickly Stalks and Foot Stalks, Leaves hairy on their under Side, and bristly half-winged Empalements. *Rosa Provincialis major, flore pleno ruberrimo.* Boerb. Ind. alt. 2. 252. Larger Provence Rose with a very red double Flower, commonly called Provence Rose.

19. *ROSA caule inermi pedunculis aculeatis, calycibus semipinnatis.* Rose with an unarmed Stalk, prickly Foot Stalks, and half-winged Empalements to the Flowers. *Rosa incarnata, Park. Par.* The Blush Rose.

20. *ROSA caule subinermi, foliis quinis subtus villosis, calycis foliolis indivisis.* Rose with a Stalk almost unarmed, Leaves having 5 Lobes, and hairy on their under Side, and the Leaves of the Empalement undivided. *Rosa rubra.* Ger. The red Rose.

21. *ROSA foliis pinnatis serratis subtus villosis aculeis oppositis,*

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oppositis, calycis foliolis indivisis. Rose with winged sawed Leaves hairy on their under Side, Spines placed opposite, and the small Leaves of the Empalement undivided. *Rosa odore cinnamomi, flore pleno.* C. B. P. 483. The double Cinnamon Rose.

22. *ROSA caule petiolisque aculeatis, pedunculis calyibusque pilosissimis.* Rose with armed Stalks and Foot Stalks of the Leaves, and the Foot Stalks and the Empalements of the Flower very hairy. *Rosa rubra plena, spinosissima, pedunculo musceto.* Boerb. Ind. alt. 2. p. 252. The most thorny, double, red Rose, with a mossy Foot Stalk, commonly called Moss *Provence* Rose.

There are a great Variety of double Roses now cultivated in the *English* Gardens; most of them have been accidentally obtained from Seeds, so that they must not be ranged as distinct Species, therefore I shall only insert their common Names, by which they are known in the Gardens, that those, inclined to collect all the Varieties, may be at no Loss for their Titles. The Sorts before enumerated, I believe, are distinct Species, as their specific Characters are different, though it is difficult to determine which of them are really so, therefore I do not positively assert they are distinct Species, though I have great Reason to believe they are so.

The Varieties of Garden Roses, not before mentioned:

The monthly Rose,	} These are all supposed to be Varieties of the Damask Rose.
The striped monthly Rose,	
The <i>York</i> and <i>Lancaster</i> Rose,	
Mrs. <i>Hart's</i> Rose.	

The red *Belgick* Rose is supposed a Variety of the *Blush Belgick*.

The single Velvet Rose,	} These three are all Varieties; the last I raised from the Seeds of the pale <i>Provence</i> Rose.
The double Velvet Rose,	
The Royal Velvet,	
The childing Rose	
The marbled Rose,	} These three have great Affinity with each other.
The double Virgin Rose.	

The *Cabbage Provence* is only a Variety of the common *Provence*.

The *Blush* or pale *Provence* is a Variety of the red *Provence*.

The white monthly	} are Varieties of the Damask Rose.
The white Damask	

The *Frankfort* Rose may be a distinct Species, but is of little Value; the Flowers rarely open fair, and have no Odour.

The double sweet Briar	} are Varieties of the common Sort.
The ever-green sweet Briar	
The double <i>Blush</i> sweet Briar.	

The *Austrian* Rose with red and yellow Flowers is only an accidental Variety.

The double yellow Rose is a Variety of the single yellow.

The *Rosa Mundi* is a Variety of the red Rose.

The small, white, and semidouble white are Varieties of the common white.

The 1st before enumerated is very common in Hedges in most Parts of *England*, so is not cultivated in Gardens. The Heps of this are used in Medicine for making a Conserve. The *Bedeguar*, which is a hairy spongy Excrecence occasioned by the Bite of small *Ichneumon* Flies, grows upon the Stalks and Branches of this Plant, and sometimes upon other Sorts of

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Roses. There are two or three Varieties of this Rose commonly met with in Hedges, one with a white, another with a red Flower, and one with smooth Leaves; the two first are evidently Varieties, but I doubt if the last is not a distinct Species.

The 2d. Sort grows naturally in many Parts of *England*; this seldom rises above 3 Feet high. The Stalks are slender, and closely armed with small Spines; the Leaves are small, and composed of 3 Pair of roundish Lobes terminated by an odd one; the Flowers are white, and have an agreeable musky Scent. This propagates fast by its creeping Roots.

The 3d. Sort grows naturally in the northern Counties in *England*; this rises with strong Stalks 7 or 8 Feet High. The young Branches are covered with a smooth brown Bark; the Spines are few, and very strong; the Leaves are large, and hairy on both Sides, they are composed of three Pair of oblong oval Lobes terminated by an odd one; they are deeply sawed on the Edges; the Flowers are large, single, and of a red Colour; they appear the Beginning of *June*, and are succeeded by large roundish Heps or Fruit, set with soft Prickles; these have a pleasant acid Pulp surrounding the Seeds, therefore are by some Persons preserved, and made into a Sweetmeat, which is served up in Deserts to the Table.

The 4th Sort is the common sweet Briar, so well known as to need no Description; this is found growing naturally in some Parts of *Kent*.

The 5th Sort is the Dwarf Burnet-leaved *Scotch* Rose, of which there are two Varieties, one with a variegated Flower, the other of a livid red Colour; the latter is the same with the *Rosa Alpina, pumila, montis rosarum, pimpinellæ foliis minoribus ac rotundioribus flore minimo lividae rubente.* Hort. Catb. for I have dried Specimens of this which were sent me from *Italy*, and by comparing them with the *Scotch* Rose, I find they are the same. This Sort seldom rises more than a Foot high. The Stalks are covered with a brown Bark, and are closely armed with small Spines; the Leaves are very small, and have a Resemblance to those of Burnet; the Flowers are small, and sit close to the Branches; the Fruit is round, and of a deep purple Colour inclining to black when ripe.

The 6th Sort rises 6 or 7 Feet High. The Stalks and Branches have no Spines, but are covered with a smooth reddish Bark; the Leaves are composed of three Pair of thin oval Lobes terminated by an odd one; they are very smooth, of a bright green, and very slightly sawed on their Edges, standing pretty far asunder on the Mid-rib; the Foot Stalks of the Flowers are armed with bristly Hairs; the 5 Leaves of the Empalement are long, slender in the Middle, but terminate in an oval leafy Point; Flowers are single, of a bright red Colour, and appear the beginning of *May*; they are succeeded by long Spear-shaped Heps which are smooth. The Plants produce a second Crop of Flowers about the End of *August*, but these fall off, and are not succeeded by Heps.

The Seeds of the 7th Sort were sent me from *Spain*, where the Plants grow naturally; this rises with strong upright Stalks, about 3 Feet high, armed with strong Thorns. The Leaves are hairy on both Sides; the Lobes

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Lobes roundish, and sawed on their Edges; the small Leaves of the Empalement are acutely sawed; the Flowers are single, of a bright red Colour, and appear early in *May*; they are followed by large smooth, roundish Heps which ripen the End of *August*.

The 8th Sort was discovered by Signior *Micheli*, growing in the Woods near *Florence*, who sent it to Dr. *Boerhaave* of *Leyden*, in whose curious Garden I saw it in the Year 1727. this hath slender Stalks which trail upon the Ground, unless supported, and, if trained up to a Pole or the Stem of a Tree, will rise 12 or 14 Feet high; they are armed with crooked reddish Spines, and garnished with small Leaves composed of three Pair of oval acute-pointed Lobes terminated by an odd one; they are of a lucid green, and sawed on their Edges; they continue green all the Year; the Flowers are small, single, white, and have a musky Odour; these in their natural Place of Growth continue in Succession great Part of the Year, but their Time of flowering in *England* is in *June*.

The 9th Sort grows naturally in *Spain*; this rises with erect Stalks, 5 or 6 Feet high, covered with a green Bark, and armed with strong crooked white Spines. The Leaves are composed of 5 oval Lobes ending in acute Points; they are smooth, of a lucid green, and slightly sawed on their Edges; these continue all the Year, and make a goodly Appearance in Winter. The Flowers grow in large Bunches or Umbels at the End of the Branches; they are single, white, and have a strong musky Odour; they appear in *August*, and, if the Autumn proves favourable, will continue in Succession till *October*.

The 10th Sort grows naturally in *Virginia* and other Parts of *North America*; this rises with several smooth Stalks 5 or 6 Feet High. The young Branches are covered with a smooth purple Bark; the Leaves are composed of 4 or 5 Pair of Spear-shaped Lobes terminated by an odd one; they are smooth on both Sides, of a lucid green on their upper, but pale on their under, and deeply sawed on their Edges; the Flowers are single, of a livid red Colour, and appear in *July*; the Empalement is divided into 5 long narrow Segments which are entire. This is kept in Gardens for Variety, but the Flowers have little Scent.

The 11th Sort is the single yellow Rose; this hath weak Stalks which send out many slender Branches closely armed with short crooked brown Spines. The Leaves are composed of 2 or 3 Pair of oval thin Lobes terminated by an odd one; they are smooth, of a light green, and sharply sawed on their Edges; the Flowers grow on short Foot Stalks; they are single, and of a bright yellow Colour, but have no Scent.

The 12th Sort is commonly called the *Austrian* Rose. The Stalks, Branches, and Leaves are like those of the last, but the Leaves rounder; the Flowers are larger; the Petals have deep Indentures at their Points; they are of a bright yellow within, and of a purplish Copper Colour on the Outside; they are single, have no Scent, and soon fall away. There is frequently a Variety of this with yellow Flowers upon one Branch, and Copper Colour upon another. This Sort of Rose loves an open free Air and a northern Aspect.

The 13th Sort is the Musk Rose; this rises with weak Stalks, 10 or 12 Feet High, covered with a smooth green-

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ish Bark, and armed with short strong Spines. The Leaves are smooth, composed of three Pair of oval Spear-shaped Lobes terminating in Points ending with an odd one; they are of a light green Colour, and sawed on their Edges; the Flowers are produced in large Bunches in Form of Umbels at the End of the Branches; they appear in *August*, and continue in Succession till the Frost stops them; they are white, and have a fine musky Odour. There is one with single, and another with double Flowers of this Sort. The Stalks of these Plants are too weak to support themselves, so the Plants should be placed where they may have Support.

The 14th Sort is the *Dutch* hundred-leaved Rose; this rises with prickly Stalks about 3 Feet high. The Leaves have sometimes three, at others 5 Lobes; the Lobes are large, oval, smooth, and of a dark green with purple Edges; the Foot Stalk of the Flower is set with brown bristly Hairs; the Empalement is smooth and half-winged; the Flowers are very double, and of a deep red Colour, but have little Scent.

The 15th is the *Damask* Rose; this rises with prickly Stalks 8 or 10 Feet high, covered with a greenish Bark, and armed with short Spines. The Leaves are composed of two Pair of oval Lobes terminated by an odd one; they are of a dark green on their upper Side, but pale on their under; the Borders frequently turn brown, and are slightly sawed; the Foot Stalks of the Flowers are set with prickly Hairs; the Empalement of the Flower is Wing pointed and hairy; the Flowers are of a soft pale red, and not very double, but have an agreeable Odour; the Heps are long and smooth.

The 16th is the common large white Rose, so well known as to need no Description. Of this there are two Varieties, one with a half double Flower, having but 2 or 3 Rows of Petals, the other has a smaller Flower, and the Shrub is of lower Growth.

The 17th Sort is called the *Blush Belgick* Rose; this rises about 3 Feet high with prickly Stalks. The Leaves are composed either of 5 or 7 oval Lobes, hairy on their under Side, slightly sawed on their Edges; the Foot Stalks of the Flowers and the Empalements are hairy, and without Spines; the Empalements are large and half-winged; the Flowers very double, of a pale Flesh Colour, and have but little Scent. It generally produces great Quantities of Flowers. The red *Belgick* Rose differs from this only in the Colour of the Flower, which is of a deep red.

The 18th Sort is the common *Provence* Rose, well known in the *English* Gardens, being cultivated in great Plenty in the Nurseries, and is one of the most beautiful Sorts yet known. The Flowers of this are sometimes very large, and the Petals closely folded over each other like Cabbages, from whence it is called the Cabbage Rose. The Flowers have the most fragrant Odour of all the Sorts, therefore is better worth propagating.

The 19th Sort is the *Blush* Rose. The Stalks of this rise from 3 to 4 Feet high, and are not armed with Spines; the Leaves are hairy on their under Side; the Foot Stalks of the Flowers are armed with some small Spines; the Empalement of the Flower is half-winged; the Flowers have 5 or 6 Rows of Petals which are large, and spread open; they are of a pale Blush Colour, and have a musky Scent.

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The 20th Sort is the common red Rose, used in Medicine. The Stalks of this grow erect, and have scarce any Spines; they rise from 3 to 4 Feet high; the Leaves are composed of 3 or 5 large oval Lobes, hairy on their under Side; the small Leaves of the Empalement are undivided the Flowers large, but not very double, spread open wide, and decay soon; they are of a deep red Colour, and have an agreeable Scent. The *Rosa Mundi* is a Variety of this with striped Flowers.

The 21st Sort is the double Cinamon Rose; this is one of the smallest Flowers, and the earliest of all the Kinds. The Stalks rise about 4 Feet high; are covered with a purplish smooth Bark, and have no Spines but at the Joints immediately under the Leaves, where they are placed by Pairs; they are short and crooked. The Leaves are composed of 3 Pair of oval Lobes terminated by an odd one; they are hairy on their under Side, and sawed on the Edges; the Leaves of the Empalement of the Flower are narrow and entire; the Flower is small, double, and has a Scent like Cinnamon, from whence it has the Title of Cinnamon Rose.

The 22d Sort is called the Moss *Provence* Rose from the Resemblance which the Flowers have to those of the common *Provence* Rose, yet it is undoubtedly a distinct Species, for although the Stalks and Shoots of this are very like those of the common, yet the Plants are difficult to propagate, which the common Sort is not. This very rarely sends up Suckers from the Root, and when the Branches are layed down, they are long before they put out Roots, so that this Sort has been frequently propagated by budding it on Stocks of other Sorts of Roses, but the Plants so raised are not so durable as those propagated by Layers.

The Stalks and Branches of this Sort are closely armed with brown Spines; the Foot Stalks of the Flowers and the Empalements are covered with long Hair-like Moss; the Flowers are of an elegant crimson Colour, and have a most agreeable Odour.

Most of the Sorts of Roses are of foreign Growth, and have been at various Times introduced into the *English* Gardens, but they are generally Natives of northern Countries, or grow on the cold Mountains in the warmer Parts of *Europe*, so they are very hardy in Respect to Cold, but love an open free Air, especially the yellow Rose, the *Austrian* Rose, and the Monthly Rose. The two former will not Flower in a warm Soil and Situation, nor near the Smoke of *London*, and the monthly Rose will flower much better in a free open Air, than within the Reach of the Smoke of *London*.

The usual Time of these Shrubs producing their Flowers is from the Middle or latter End of *May* till the Middle of *July*.

But in order to continue these Beauties longer than they are naturally disposed to last, it is proper to plant some of the monthly Roses near a warm Wall, which will occasion their budding at least three Weeks or a Month before those in the open Air, and, if you give them the Help of a Glass before them, it will bring their Flowers much forwarder, especially where Dung is placed to the Backside of the Wall (as is practised in raising early Fruits); by this Method I have seen fair Roses of this Kind blown in *February*, and they

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may be brought much sooner against hot Walls, where People are curious this Way.

You should also cut off the Tops of such Shoots which have been produced the same Spring, early in *May*, from some of these Sorts of Roses which are planted in the open Air, and upon a strong Soil; this will cause them to make new Shoots, which will flower late in Autumn, as will also the late removing the Plants in Spring, provided they do not suffer by Drought, as I have several Times experienced, but particularly in the Year 1718, when I had Occasion to remove a large Parcel of these Plants in *May*, just as they were beginning to flower, in doing which I cut off all the Flower Buds, and, after having opened a Trench where they were to be planted, I poured a large Quantity of Water, so as to render the Ground like a Pap; then I took up the Plants, and placed them therein as soon as possible, that their Roots might not dry, and, after planting them, I watered the Ground well again, and covered the Surface over with Mulch to prevent the drying; after this I repeated watering the Plants all over two or three Times a Week, in the Evening, until they had taken Root. In about three Weeks Time the Plants shot out again, and produced a great Quantity of Flowers in *August* and *September*, which were as fair as those produced in *June*. This is the best Sort of Rose for this Purpose, there being no other Sort which will flower both early and late so well as this.

The next Sort of Rose, which flowers in the open Air, is the Cinnamon, which is immediately followed by the Damask Rose, then the Blush *Tok*, and *Lancaster* come, after which the *Provence*, *Dutch*, hundred-leaved, white, and most other Sorts of Roses follow, and the latest Sorts are the Musk Roses, which, if planted in a shady Situation, seldom flower until *September*, and, if the Autumn proves mild, will continue often till the Middle of *October*.

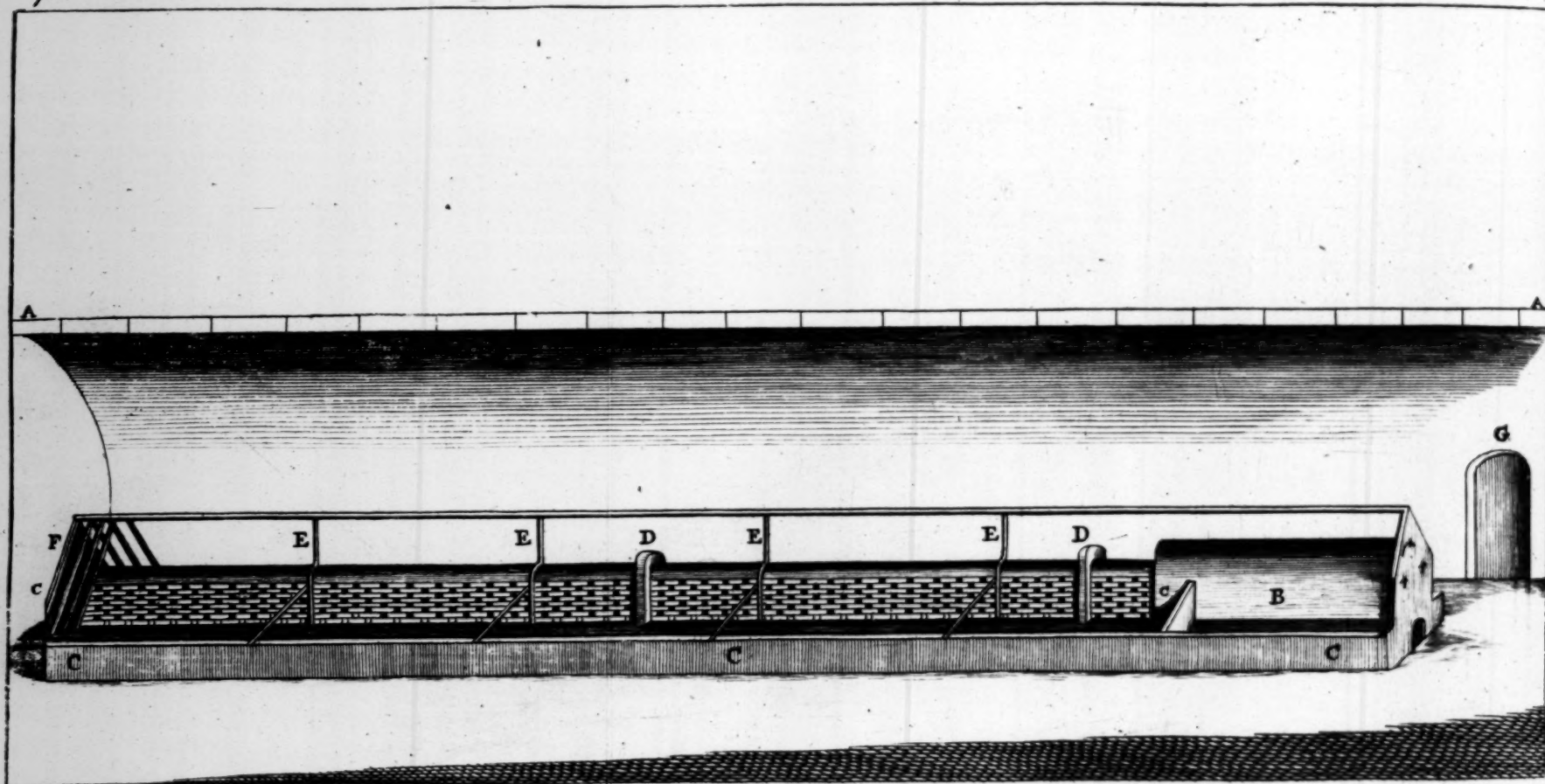
The Plants of these two Sorts should be placed against a Wall, Pale, or other Building, that their Branches may be supported, otherwise they are so slender and weak, as to trail on the Ground. These Plants should not be pruned until Spring, because their Branches are somewhat tender, so that when they are cut in Winter, they often die after the Knife; these produce their Flowers at the extremity of the same Year's Shoots in large Bunches, so that their Branches must not be shortened in the Summer lest the Flowers should be cut off. These Shrubs will grow to be 10 or 12 Feet high, and must not be checked in their Growth, if you intend they should flower well, so that they should be placed where they may be allowed Room.

The lowest Shrub of all the Sorts here mentioned is the *Scotch* Rose, which rarely grows above 2 Feet high, so that this must be placed among other Shrubs of the same Growth. The red Rose and the *Rosa Mundi* commonly grow from 3 to 4 Feet high, but seldom exceed that, but the Damask, *Provence*, and *Frankfort* Roses grow to the Height of 7 or 8 Feet, so that in planting them great Care should be taken to place their several Kinds, according to their various Growth, amongst other Shrubs, that they may appear beautiful to the Eye.

The yellow Rose, as also the *Austrian* Rose, are both Natives

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The Arched Room cut Perpendicularly thro' the middle where the Kiln stands, with a representation of the Kiln.



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Natives of *America*; these were originally brought from *Canada* by the *French*; the other Varieties, now in the Gardens, of these Sorts, have been accidentally obtained, and are preserved by budding them on the other Sorts the Shrubs of these Roses seldom shoot so strong as most of the other Sorts, especially in the light Land near *London*, where they seldom produce their Flowers. These are esteemed for their Colour, being very different from all the other Sorts of Roses, but, as their Flowers have no Scent, and are of short Duration, they do not merit the Price they are generally sold at.

The *Frankfort* Rose is of little Value except for a Stock to bud the more tender Sorts upon, for the Flowers seldom open fair, and have no Scent; but, it being a vigorous Shooter, renders it proper for Stocks to bud the yellow and *Austrian* Roses, which will render them stronger than on their own Stocks, but the yellow Roses seldom blow fair within 8 or 10 Miles of *London*, though in the northern Parts of *Great Britain* they flower extremely well. This Sort must have a northern Exposure, for, if it is planted too warm, it will not flower.

The *Damask* and monthly Rose seldom flower well in small confined Gardens, nor in the Smoke of *London*, therefore are not proper to plant in such Places, though they frequently grow very vigorously there. They always begin to shoot the first of any of the Sorts in the Spring, therefore frequently suffer from Frosts in *April*, which often destroys all their Flowers.

All the Sorts of Roses may be propagated either from Suckers, Layers, or by budding them on Stocks of other Sorts of Roses, which latter Method is only practised for some peculiar Sorts, which do not grow very vigorous on their own Stocks, and send forth Suckers very sparingly, or where a Person is willing to have more Sorts than one on the same Plant; but, where this is designed, it must be observed to bud only such Sorts on the same Stalk as are nearly equal in their Manner of Growth, for if there be a Bud of a vigorous-growing Sort, and others of weak Growth budded in the same Stock, the strong one will draw all the Nourishment from the weaker, and entirely starve them.

If these Plants are propagated by Suckers, they should be taken off annually in *October*, and transplanted out either into a Nursery in Rows (as hath been directed for several other Sorts of flowering Shrubs), or into the Places where they are to remain; for if permitted to stand on the Roots of the old Plants more than one Year, they grow woody, and do not form so good Roots as if planted out the first Year, so there is more Danger of their not succeeding.

But the best Method to obtain good rooted Plants is to lay down the young Branches in Autumn, which will take good Root by the Autumn following (especially if they are watered in very dry Weather), when they may be taken from the old Plants, and transplanted where they are to remain. The Plants, which are propagated by Layers, are not so apt to send out Suckers from their Roots as those from Suckers, therefore should be preferred before them, because they may be much easier kept within Compass, and will flower much stronger. These Plants may be transplanted any Time from *October* to *April*, but, when they are designed to flower strong the first Year after planting, they should be

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planted early, though, as I said before, if they are planted late in Spring, it will cause them to flower in Autumn, provided they do not suffer by Drought.

Most of these Sorts delight in a rich moist Soil and an open Situation, in which they will produce a greater Quantity of Flowers, and those much fairer, than when on a dry Soil, or in a shady Situation. The Pruning, which they require, is only to cut out their dead Wood, and take off all the Suckers, which should be done every Autumn; and, if there are any very luxuriant Branches, which draw the Nourishment from the other Parts of the Plant, they should be taken out, or shortened, to cause them to produce more Branches, if there be Occasion for them to supply a Vacancy, but you must avoid crowding them with Branches, which is as injurious to these Plants as to Fruit Trees; for, if the Branches have not equal Benefit of the Sun and Air, they will not produce their Flowers so strong, nor in so great Plenty, as when they are more open, and better exposed to the Sun, so that the Air may circulate the more freely between them.

ROSA SINENSIS. See Hibiscus.

ROSA THE GUELDER. See Viburnum.

ROSMARINUS. *Tourn. Inst. R. H. 195. Tab. 92. Lin Gen. Pl. 35. Rosemary.*

The Characters are,

The Flower has a tubulous Empalement of 1 Leaf compressed at the Top the Mouth erect, and divided into two Lips; the upper Lip is entire, and the under bifid. It hath 1 Petal; the Tube is longer than the Empalement; the Brim ringant; the upper Lip short, erect, and divided into 2 Parts, whose Borders are reflexed; the lower Lip is reflexed, and cut into 3 Parts the middle Segment being large and concave. It hath 2 Awl-shaped Stamina, inclining toward the upper Lip, terminated by single Summits, and a four-pointed Germen, with a Style the Shape, Length, and in the same Situation with the Stamina, crowned by an acute Stigma. The Germen afterward becomes four oval Seeds sitting in the Bottom of the Empalement.

The Species are,

1. ROSMARINUS foliis linearibus marginibus reflexis, subtus incanis. Rosemary with linear Leaves reflexed on their Edges, and hoary on their under Side. *Rosmarinus bortenfis, angustiore folio. C. B. P. 217.* Garden Rosemary with a narrower Leaf.

2. ROSMARINUS foliis linearibus obtusis, utrinque virentibus. Rosemary with obtuse linear Leaves green on both Sides. *Rosmarinus spontaneus latiore folio. C. B. P. 217.* Broad-leaved wild Rosemary.

The two Sorts have been frequently supposed the same, and their Difference accidental, but I have long cultivated both, and have raised them from Seeds without finding them vary, so I believe they are distinct Species. The Leaves of the 2d Sort are broader than those of the 1st, and their Points are obtuse; the Flowers are also much larger, and of a deeper Colour, and the Stalks grow larger, and spread out their Branches wider, and the whole Plant has a stronger Scent. These Differences the Gardeners, who cultivate the Plants for the Market, observe.

There are two other Varieties of these Plants, one of the 1st Sort with striped Leaves, which the Gardeners

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deners call the Silver Rosemary, and is at present rare in the *English* Gardens, all the Plants of this which were here before the severe Winter in 1740 having been then killed; the other is of the 2d Sort, which is striped with yellow; this the Gardeners call the Gold striped Rosemary. The Plants of this Sort are pretty hardy, so will live in the open Air through our common Winters, if they are on a dry Soil.

These Plants grow plentifully in the southern Parts of *France*, in *Spain*, and in *Italy*, where, upon dry rocky Soils near the Sea, they thrive prodigiously, and perfume the Air so as to be smelt at a great Distance from the Land; but, notwithstanding they are produced in warm Countries, they are hardly enough to bear the Cold of our ordinary Winters very well in the open Air, provided they are planted on a poor, dry, gravelly Soil, on which they will endure the Cold much better than on a richer Soil, where the Plants will grow more vigorously in Summer, and so be more subject to Injury from Frost, and they will not have so strong an aromack Scent as those upon a dry barren Soil.

The Sorts with striped Leaves are somewhat tender, especially that with silver Stripes, so should either be planted near a warm Wall, or in Pots filled with light fresh Earth, and sheltered in Winter under a Frame, otherwise they will be subject to die in frosty Weather.

These Sorts may be propagated by planting Slips or Cuttings of them in the Spring of the Year, just before the Plants begin to shoot, on a Bed of light fresh Earth, and, when rooted, they may be transplanted into the Places where they are designed to grow, but it will be proper to do this about the Beginning of *September*, that they may take new Root before the frosty Weather comes on; for, if they are planted too late in Autumn, they seldom live through the Winter, especially if the Weather proves very cold, so that, if you do not transplant them early, it will be better to let them remain unremoved until *March* following, when the Frost is over, observing never to transplant them at a Season when the dry East Winds blow, but rather defer doing of it until the Season is more favourable; for, if they are planted when there are cold drying Winds, their Leaves are apt to dry up, which often kills them; but, if there happen to be some warm Showers soon after they are removed, it will cause them to take Root immediately, so that they will require no farther Care, but to keep them clear from Weeds.

Although these Plants are tender when planted in a Garden, yet, when they are by Accident rooted in a Wall (as I have several Times seen them), they will endure the greatest Cold of our Winters, though exposed much to the cold Winds, which is occasioned by the Plants being more stunted and strong, and their Roots being drier.

The Flowers of the narrow-leaved Garden Sort are used in Medicine, as are also the Leaves and Seeds.

ROYENA. *Lin. Gen. Plant.* 491.

The Title of this Genus was given to it by Dr. *Linnaeus*, in Honour of Dr. *Adrian Van Royen*, late Professor of Botany at *Leyden* in *Holland*.

The Characters are,

The Flower has a bellied permanent Empalement of 1 Leaf, whose Mouth is obtuse and free pointed. It is of 1 Petal, having a Tube the Length of the Empalement, but the Brim is divided into 5 Parts which turn back. It hath 10 short Stamina growing to the Petal, terminated by oblong, erect, Twin Summits the Length of the Tube, and an oval hairy Germen sitting upon 2 Styles a little longer than the Stamina, crowned by single Stigmas. The Empalement afterward turns to an oval Capsule with 4 Furrows, having one Cell with 4 Valves, containing 4 oblong triangular Seeds.

The Species are,

1. ROYENA foliis ovatis scabrisculis. *Hort. Cliff.* 149. Royena with oval rough Leaves. *Staphylodendrum Africanum, foliis singulari lucido. Herm. Parad.* 232. African Bladder-nut with a single shining Leaf.

2. ROYENA foliis lanceolatis glabris. *Prod. Leyd.* 441. Royena with smooth Spear-shaped Leaves. *Vitis Idæa Æthiopica, buxi minoris folio, floribus albis. Hort. Amst.* 1. p. 125. Ethiopian Whortleberry, with a smaller Box Leaf and white Flowers.

3. ROYENA foliis lanceolatis hirsutis. *Prod. Leyd.* 441. Royena with hairy Spear-shaped Leaves. *Staphylodendrum Africanum, folio lanuginoso rosmarini latiori. Boerb. Ind.* alt. 2. p. 235. African Bladder-nut with a broader downy Rosemary Leaf.

The 1st Sort has been long an Inhabitant of some curious Gardens in *England*, but it is not very common here, for it is very difficult to propagate.

This Plant grows 8 or 10 Feet high, and puts out its Branches on every Side, so may be trained up to a regular Head: The Branches are clothed with oval shining Leaves, placed alternately, and continue all the Year, so makes an agreeable Variety among other exoticks in the Green-house during the Winter Season. The Flowers are produced from the Wings of the Leaves along the Branches, but as they have little Beauty, few Persons regard them. I have not observed any Fruit produced by these Plants in *England*.

The 2d Sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby Stalk 5 or 6 Feet high, sending out many slender Branches, covered with a purplish Bark, and garnished with small oval Leaves less than those of the Box Tree; they are smooth, entire, and of a lucid green, continuing all the Year. The Flowers come out from the Wings of the Leaves round the Branches they are shaped like a Pitcher and are white; these are succeeded by roundish purple Fruit, which ripen in the Winter.

The 3d Sort grows naturally at the *Cape of Good Hope*; this rises with a strong woody Stalk 7 or 8 Feet high, covered with a gray Bark, sending out many small Branches alternately, which are garnished with Spear-shaped Leaves about an Inch long, and a Quarter broad in the Middle; they are hoary, and covered with soft Hairs. The Flowers come out upon short Foot Stalks from the Side of the Branches, they are of a worn-out purple Colour and small. They appear in *July*, but are not succeeded by Seeds in *England*.

These Plants are too tender to live through the Winter in the open Air in *England*, therefore must be removed

moved into the Green-house in Autumn, and treated as Orange Trees, with which Culture the Plants will thrive. The 1st and 3d Sorts are difficult to propagate here, for the Branches which are laid down, seldom put out Roots, and those which do, are two Years before they will have made Roots sufficient to transplant, and their Cuttings very rarely succeed; and these are the only Methods by which they can be increased in those Countries, where they do not produce Seeds. The best Time to plant the Cuttings, is early in Spring; these should be planted in small Pots filled with soft loamy Earth, and plunged into a very moderate hot Bed. The Pots should be closely covered down with Hand Glasses to exclude the external Air, and the Cuttings refreshed with a little Water every eighth or tenth Day, as the Earth becomes dry, for much Moisture will kill them. If the Cuttings shoot, they must be gradually inured to bear the open Air, and when they are well rooted, should be each planted in a separate small Pot, and treated as the old Plants.

If the Plants put out any young Shoots from the Bottom, they should be carefully laid down in the Ground while young, because when the Shoots are tender, they are more apt to put out Roots, than after they are become woody and hard; these Branches should be slit as is practised in laying Carnations: They must be frequently, but gently watered, during the warm Weather in Summer, but in cold Weather it must be sparingly given them; when these are rooted, they may be taken off, and treated as the Cuttings.

The 2d Sort is very apt to send up Suckers from the Roots, which may be taken off with the Roots, and thereby increased; or those which do not put out Roots, may be laid down as the former; and the Cuttings of this more frequently succeed than those of the other, so that this Sort is much easier propagated.

RUBIA. *Tourn. Inst. R. H.* 113. *Tab. 38. Lin. Gen. Pl.* 119. [takes its Name from its red Colour, because the Root of this Plant is used in dyeing a red Colour.] Madder; in *French, Garance.*

The Characters are,

The Empalement of the Flower is small, cut into 4 Segments, and sits upon the Germen. The Flower has 1 Bell-shaped Petal having no Tube, but is divided into 4 Parts. It hath 4 Awl-shaped Stamina shorter than the Petals, terminated by single Summits; and a Twin Germen under the Flower, supporting a slender Style divided into two Parts upward, and crowned by two beaded Stigmas. The Germen afterward becomes two smooth Berries joined together each having one roundish Seed with a Navel.

The Species are,

1. RUBIA *foliis senis lanceolatis supernè glabris.* Madder with six Spear-shaped Leaves in Whorls, whose upper Surfaces are smooth. *Rubia tinctorum sativa C. B. P.* 333. Cultivated Dyer's Madder.

2. RUBIA *foliis inferioribus senis, supernè quaternis binisve, utrinque asperis.* Madder with the lower Leaves growing by Sixes round the Stalks, and the upper ones by Fours or Pairs, which are rough on both Sides. *Rubia sylvestris aspera, quæ sylvestris Dioscoridis. C. B. P.* 333. Rough wild Madder of *Dioscorides.*

3. RUBIA *foliis quaternis. Prod Leyd.* 254. Madder with four Leaves placed round the Stalks. *Rubia Qua-*

drifolia asperissima lucida peregrina. H. L. 523. Foreign four-leaved Madder, with shining rough Leaves.

The 1st Sort, which is cultivated for the Root that is used in dyeing and staining Linens, grows naturally in the *Lewant*. This hath a perennial Root, and an annual Stalk; the Root is composed of many long, thick, succulent Fibres, almost as large as a Man's little Finger; these are joined at the Top in a Head, like the Roots of Asparagus, and root very deep into the Ground; I have taken up Roots, whose strong Fibres have been more than 3 Feet long; from the upper Part (or Head of the Root) come out many Side Roots, which extend just under the Surface of the Ground to a great Distance whereby it propagates very fast; for these send up a great Number of Shoots, which, if carefully taken off in the Spring, soon after they are above Ground, become so many Plants. These Roots are of a reddish Colour, somewhat transparent, and have a yellowish Pith in the Middle, which is tough and of a bitterish Taste; from the Root arise many large four-cornered jointed Stalks, which in good Land will grow 5 or 6 Feet long, and, if supported, sometimes 7 or 8; they are armed with short herbaceous Prickles, and at each Joint are placed 5 or 6 Spear-shaped Leaves, about 3 Inches long, and near 1 broad in the Middle, drawing to a Point at each End; their upper Surfaces are smooth, but their Mid-rib on the under Side armed with rough herbaceous Spines; the Leaves sit close to the Branches in Whorls. From the Joints of the Stalk come out the Branches, which sustain the Flowers; they are placed by Pairs opposite, each Pair crossing the other; these have a few small Leaves toward the Bottom, which are by Threes, and upward by Pairs opposite; the Branches are terminated by loose branching Spikes of yellow Flowers, cut into 4 Parts resembling Stars. These appear in June, and are sometimes succeeded by Seeds, which never ripen in England.

The 2d Sort grows naturally in Spain; this hath perennial Roots like those of the first Sort, but are much larger; the Stalks are smaller than those of the first Sort, and are almost smooth; their lower Parts are garnished with narrow Leaves, placed by Sevens in Whorls round the Stalks, but upward they diminish to 4, 3 and 2 toward the Top; these are rough on both Sides; at each Joint of the Stalk come out 2 short Foot Stalks opposite, having 2 small rough Leaves, and end with branching Foot Stalks, sustaining small yellow Flowers. This Sort flowers the latter End of June, but does not produce Seeds here.

The 3d Sort grows naturally in Spain and the *Balearrick Islands*; I received the Seeds from *Gibraltar*, and *Minorea*, where the Plants grew out of the Crevices of the Rocks. The Roots of this Sort are much smaller than those of the two former, but less succulent; they strike deep into the Ground, and send up several slender four-cornered Stalks which are perennial; these grow a Foot and a Half long, and divide into many Branches, whose Joints are very near each other; they are garnished with short stiff rough Leaves, placed by Fours round the Stalk; they are about an Inch long, and half an Inch broad in the Middle; of a lucid green, and continue all the Year. This has not produced Flowers in England.

There is a Sort which grows naturally in *Wales*, and also upon *St. Vincent's Rock*, which has 4 Leaves at each Joint, narrower and longer than those of the third Sort; the Stalks of this are perennial, and the Leaves ever-green, so that Mr. Ray has mistaken this Plant, having supposed it to be the second, which hath annual Stalks rising much higher, therefore I should rather think it might be the third Sort, if they were equally hardy; but the third Sort is so tender, as to be always killed by severe Frosts in *England*.

The 1st Sort is that cultivated for the Use of the Dyers and Callico Printers, and is so essential to both Manufactories, as that neither of them can be carried on without this Commodity; and the Consumption of it is so great here, that on a moderate Computation, there is annually so much imported from *Holland*, as the Price of it amounts to more than one hundred and eighty thousand Pounds sterling; which might be saved to the Publick, if a sufficient Quantity were planted in *England*, where it might be cultivated to greater Advantage than in *Holland*, the Lands here being better adapted to this Plant. But as the growing of this Plant in Quantity, has been for several Years discontinued, so the Method of Culture is not well known to many Persons here; and as there is at present an Inclination in the Publick to regain this lost Branch of Trade (for formerly their was not only enough of this Commodity raised in *England* for our own Consumption, but also great Quantities of it were sent Abroad), we shall here give a full Account of the Culture of the Plant, and of the Method of preparing the Root for Use; and shall begin with the Method now practised in *Zealand*, where the best and greatest Quantity of Madder is now raised.

In all the *Netherlands*, there is no where better Madder cultivated, than in *Schouwen*, one of the Islands of *Zeland*, which is performed in the following Manner:

The Land designed for Madder, if strong and heavy, is ploughed twice in Autumn, that the Frost in Winter may mellow it and break the Clods; then it is ploughed again in the Spring, just before the Time of planting the Madder; but if the Ground is light, then it is ploughed twice in the Spring; at the last Ploughing it is divided into Lands of 3 Feet broad, with Furrows between each Land, 4 or 5 Inches deep. Madder requires a loamy substantial Soil, not too stiff and heavy, nor over light and sandy; for although it may thrive tolerably well in the latter, yet such Land cannot have a second Crop of Madder planted upon it in less than 8 or 10 Years Interval; but in *Schouwen*, where the Land is substantial, they need not stay longer than 3 or 4 Years, in which Interval the Ground is sown with Corn, or planted with any Kind of Pulse. It is granted, that the best Land for producing of Madder is in *Schouwen*, where a Gemet of Land, which is three hundred square Rods of 12 Feet each, will yield from 1000 to 3000 Pounds Weight, according to the Goodness of the Land and the Favourableness of the Seasons; but in light Land, the Quantity is from 500 to 1000 Pounds Weight.

The Time for planting Madder begins toward the End of *April*, and continues all *May*, and sometimes in very backward Springs, there is some Madder planted the Beginning of *June*. The young Shoots from the

Sides of the Root are taken off from the Mother Plant, with as much Root as possible; these are called *Kiemen*, and are planted with an Iron Dibble in Rows at one Foot asunder, and commonly four *Kiemen* in a Row.

The Quantity of these Slips (or *Kiemen*) required to plant one Gemet of Land, is sold at different Prices, according to the Price which Madder bears, or to the Demand for the Plants; they are often sold from 15 to 20 Guilders, and sometimes they have been sold for 10 or 11 Pounds *Flemish*, but the lowest Price is from 15 Guilders to 3 Pounds *Flemish*.

The Expence of planting out a Gemet of Land with Slips (or *Kiemen*) costs for Labour only, from 16 to 20 Guilders, according as the Land is heavy or light: There are generally employed six Men to plant, two to rake the Ground, these earn each a Guilder a Day; and five or six Women or Boys, called Carpers or Pluckers of the Shoots or *Kiemen*, these earn 12 Dutch Pence a Day, or 2 Shillings.

The first Year the Madder is planted, it is customary to plant Cabbages or Dwarf Kidney Beans, in the Furrows between the Beds, but there is always great Care taken to keep the Ground clean from Weeds; this is generally contracted for at 2 Pounds *Flemish* for each Gemet of Land.

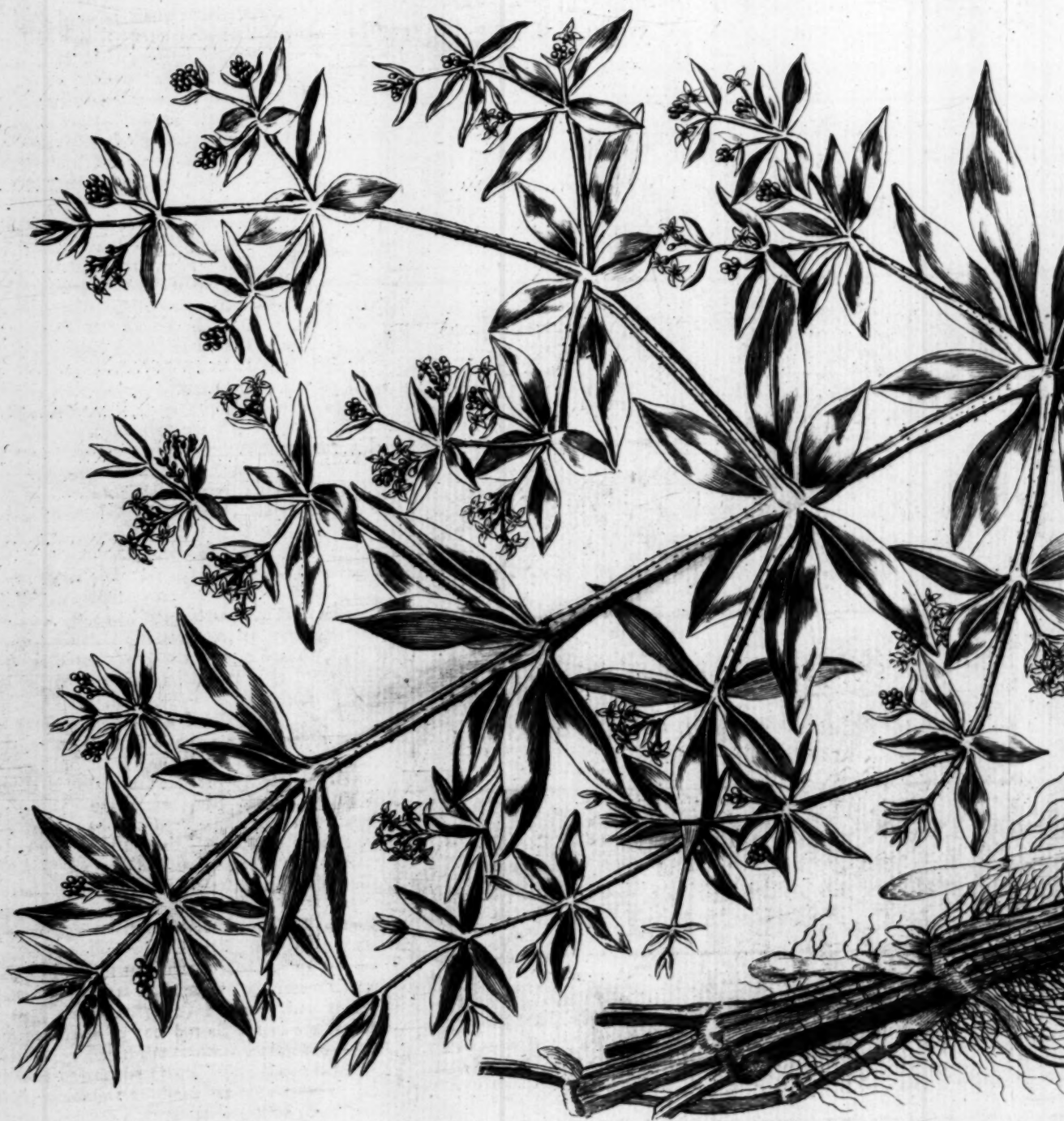
In *September* or *October*, when the young Madder is cleaned for the last Time that Season, the green Haulm (or Stalks) of the Plants, is carefully spread down over the Beds, without cutting any Part off, and in *November* the Madder is covered over the Haulm with 3 or 4 Inches of Earth.

This Covering of the Madder, is performed either with the Plough or with the Spade; if it is done by the first, it costs two Guilders and a Half, or three Guilders in strong Land each Gemet, and over and above this, one Guilder and a Half to level the Tops of the Beds, and make them smooth; but it is better performed with the Spade, only it is more chargeable, for that costs from 8 to 10 Guilders each Gemet, but at the same Time the Clods are broken, and the Surface of the Beds is made smooth and even.

The second Year in the Beginning of *April*, which is about the Time the *Kiemen* or young Shoots are beginning to come out; the Earth on the Top of the Beds should be scuffled over and raked, to destroy the young Weeds, and make the Surface smooth and mellow, that the *Kiemen* may shoot out the easier above Ground; this Labour costs 3 Shillings each Gemet.

The second Summer there must be the same Care taken to keep the Madder clean as the first, and then nothing is planted in the Furrows, or suffered to grow there; the last Time of cleaning the Ground, in *September* or *October*, the green Haulm is again spread down upon the Beds; and in *November*, the Madder is again covered with Earth as the first Year.

By this Method of Culture, one can see how necessary it is to plant the Madder in Beds, for thereby it is much easier covered with the Earth of the Furrows; and hereby the Earth of the Beds is every Time heightened, whereby the Madder Roots will be greatly lengthened, and the *Kiemen* or young Shoots will have longer Necks, and by being thus deeply earthed, will put out more Fibres and have much better Roots, without





RUBIA perigrina Hort.-Cliff. 35.



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without which they will not grow; and it is of equal Use to the Mother Plants, for by this Method the Roots will be longer; and in this consists the Goodness and Beauty of the Madder, for those which have but few main Roots, are not so much esteemed as those which are well furnished with Side Roots called *Tengels*; a Madder Plant that has many of these Roots, is called a well bearded Madder Plant; therefore one must never cut off these Side Roots, for by so doing there will be a less Crop of Madder, and but few *Kiemen* or young Shoots can be produced; besides, by the Loss of Moisture, sometimes the Plants will droop and become weak; and there is great Profit in having a large Quantity of *Kiemen* to draw in the Spring, which are in Plenty the second and third Years.

The Madder Roots are seldom dug up the second Year, but generally after it has grown three Summers, therefore the Culture of the third Year is the same as in the second, during the Spring and Summer.

Before the first Day of *September*, it is forbidden to dig up any Madder in this Island; but on that Day early in the Morning, a Beginning is made, and the Person who carries the first Cart Load to the Stove, has a Premium of a golden Rider, or three Ducats.

The digging up the Madder of a *Gemet* of Land, costs from 36 to 100 Guilders, according to the Goodness of the Crop, and the Lightness or Stiffness of the Ground, but in light Land it costs from 9 to 10 Pounds *Flemish*; the Persons who are adroit in this Business, are generally paid 5 Shillings *Flemish* per Day.

The Madder produces Flowers in the Middle of Summer, and sometimes a few Seeds, but they never ripen here; nor would they be of Use to cultivate the Plants, since it is so easily done by the *Kiemen*.

Some Years past they began to plant here the great wild Madder, which was called *French Madder*, but this was not esteemed so good for Use as the tame Madder, from which it differs much, so was not continued. The more bitter the Roots of the Madder are, when taken out of the Ground before it is brought to the Stove, the less it will lose of its Weight in drying, and is the better afterward for Use.

When the Madder is dug out of the Ground, it is carried to the Stove, and there laid in Heaps, in that which is called the cold Stove, and separated with Hurdles made of Wicker, and Memorandums kept of each Parcel, and to what Countryman it belongs, that each may be dried in their Turns, and prepared or manufactured, for which Turn generally Lots are cast beforehand. The Madder thus carried to the Stove is *Relzyn*.

This *Relzyn* is carried about six o'Clock in the Morning, into the Tower or Steeple, hoisted in Baskets by Ropes to the Rooms, and divided or spread where it remains till the next Day, at two or three o'Clock in the Morning, about 20 or 21 Hours; then those Roots which have lain in the coldest Places are removed to cooler, and those in the cooler are removed to the hotter Places nearer the Oven. This is continued for 4 or 5 Days, according as there has been more or less carried there; but it is always the Goods of one Person, that every one may have his own, and of as equal Quality as possible, when it is delivered out.

When the Madder is sufficiently dried in the Tower, it is threshed on the threshing Floor, which is made clean from Dirt or Filth, and then brought to the Kiln, and spread on a Hair Cloth for about 20 Hours, during which Time the Kiln is made more or less hot as the Roots are more or less thick, or the Weather more or less cold.

From the Kiln the Madder is moved to the Pounding House, and is there pounded on an oaken Block made hollow, with six Stampers plated at the Bottom with Iron Bands; these Stampers are kept in Motion by a Mill very much resembling a Grist Mill, which is turned by three Horses; the Presence of the Pounding Master is here always required, to stir the Madder continually with a Shovel; to bring it under the Stampers. When the Madder is thus properly pounded, it is sifted over a Tub till there is enough to fill a Cask: This first Pounding, which chiefly consists of the thinnest and smallest Roots, and the Outside Husks with some Earth, which by drying and threshing could not be separated, is called *Mor Mull*.

What remains in the Sieve is put on the Block again, and pounded a second Time, and when the Pounding Master guesses a third Part is pounded, then the Madder is taken out again, and sifted over another Tub, and put into a separate Cask, and this is called *Gor gemeens*; that which remains in this second Operation, not enough pounded in the Sieve, is for the third Time put on the Block, and pounded till it is all reduced to Powder, which is called *Kor kraps*.

When the Madder is cleansed from the Dirt and Mull, and is entirely pounded at once, then it is called *Oor Onberooftde*, so that this *Onberooftde* actually consists of the *Gemeens* and *Kraps* pounded together, and sifted without separating them from each other.

When there is two thirds of *Kraps*, and one third *Gemeens*, which was separately prepared or manufactured, then they are called two and one, or marked 2.

The Sweepings of the Stove, and of the Ground and Beams being swept together is not lost, but is put amongst the Mull, or sold by itself.

The Sweepings of the Mill, and every Part of the Pounding Place, is also gathered together, and put into a Cask; this is called *Den Beer*.

When the Madder is thus prepared and put into Casks, it is in *Zealand* examined by sworn Assayers and tried, if it is not faulty packed up; that is, whether in the preparing it is properly manufactured, or falsely packed up, and to see if every Part of the Cask is filled with Madder of equal Goodness and Quality, not burned in the drying, or mixed with Dirt; which the Assayers by certain Trials, and by weighing and washing of the Madder can know, if it is according to the Statutes of the Country.

There are sundry Statutes made and published by the States of *Zealand*, concerning the preparing of Madder; as one of the 28th of *July* 1662, one on the 29th of *September*, and 31st of *October* 1671, another on the 23d of *September* 1699, and the last on the 28th of *April* 1735: By which Statutes, among other Things, it is strictly forbidden, That any Person shall prepare *Kraps*, in which there shall be more than two Pounds of Dirt in a hundred Weight; nor above 8 Pounds in the like

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like Weight of *Onberoofde*, or in *Gemeens* more than 12 Pounds in a hundred Weight.

If the Madder upon Trial is found good, the Arms of the City or Village, and the Sign of the Stove where the Madder was prepared, is painted on the Cask with black Paint. The Trial of the Madder is in no Place more exact, or more religiously observed, than in the City of *Zirkzee*, therefore the Merchants in *Germany*, who know this, always prefer the Madder of that Place to all others, and will not buy any which has not the Arms of *Zirkzee* painted upon the Casks, if they are to be had.

We before mentioned the Tower, the Kiln, &c. where the Madder is dried and prepared for Use, the Draughts of these are exhibited in the annexed Plans, with their Explanation; but that a better Judgment may be formed of their Use, we shall here take Notice, that the Tower is the Place where the Madder is first dried. This Tower is heated by 15 or 16 Pipes or Flues of Brick-work, which run on each Side the Tower under the Flower, and are covered with low burnt Tiles, some of which are loose; so that by taking up these, the Heat is moderated, and conducted to any Part of the Tower, the Person who has the Care of drying the Madder pleases.

This Tower has 4 or 5 Lofts made of strong Laths, they are 4 or 5 Feet above each other, upon which the Madder is laid; these are heated by an Oven placed in the Room where the Work People live, and is by them called the *Glory*.

The Kiln is in a Room whose Length is equal to the Breadth of the Stove, and is entirely arched over at Top; the Oven by which the Kiln is heated, is called the *Hog*; this is built on a Stone Wall, which rises a Foot or two above Ground; and the small Arch by which the Heat passes through every Part, has several square little Holes in the Brick Work, that the Heat may come out; over these Holes, on the Top of the Kiln, are laid wooden Laths the whole Length, and upon them a Hair Cloth, on which the Madder is laid to dry, before it is carried to the Pounding Place. In the Madder Stoves there is no other Fuel used but *Friezland* Turf, which gives an equal and moderate Heat.

In the Madder Stoves, the People work more by Night than Day; first, because at the Time of Year when the Madder is brought into the Stoves, the Nights are much colder than the Days; and secondly, that the Master, who must be always attentive to his Work, may not be interrupted by Visitors; and thirdly, because they see less Dust; but principally, because the Madder which is pounded in the Night is of a much better Colour than that which is pounded in the Day.

In the Madder Stoves are always constant Workmen, one who is the Dyer, who has the Care of drying the Madder in the Tower and the Kiln; for the right Performance of this, Art and Experience is required, the Goodness of the Madder greatly depending on the right drying. This Person is a Sort of Foreman, and has the Direction of all the Workmen; his Pay is five Stivers, for every hundred Weight of Madder which is prepared in the Stove; he has one Person under him for his Assistant, to perform Part of the laborious Work, and to be always at Hand; this Man is paid

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18 or 19 Shillings per Week *Flemish*, which is the constant Wages.

The third Person is the Pounder, who is always present when the Madder is pounding, who with a particular Shovel which is small, and fitted to the Cavity of the Pounding Block, stirs the Madder from Time to Time, to bring it under the Stampers; he is paid four Stivers for every hundred Weight of Madder.

The fourth is a Driver, who with a Team of three Horses, causes the Mill to turn and pound the Madder; his Pay for himself and the three Horses, from 8 to 9 Stivers per Hundred Weight, according as he can bargain.

Besides these 4, there are 5 other Assistants, who lay the Madder on and take it off; this is often performed by the Wives and Boys of the other Workmen; these 5 have 50 Stivers for every three thousand Pounds of Madder which is prepared, so they have each 10 Stivers.

There are 19 or 20 Madder Stoves in the Island of *Schouwen*, which, at an Average, prepare in one Crop, that lasts from September to February, ten thousand Weight of Madder each, which in the whole amounts to two Million Pounds Weight; and if we suppose, that the Madder is sold at an Average for four Pounds *Flemish* per Hundred Weight, which is a moderate Price, one may soon reckon what Advantage the Culture of this dyeing Commodity produces to this one Island.

The Countrymen pay to the Owners of the Madder Stoves, two Guilders for preparing every Hundred Weight of *Mull*, and for each Hundred Weight of hard Madder; that is, of *Kraps*, *Gemeens*, or *Onberoofde*, three Guilders, according as they will have them prepared.

The Building of a Madder Stove quite new from the Foundation, costs in the whole about twenty-four hundred Pounds *Flemish*, which is twelve hundred Pounds Sterling.

P L A T E I.

An Explanation of the Plan of the Cold Stove.

- Fig. 1. Is the lower Band, whose Thickness is fourteen by sixteen Inches.
2. The upper Band, which is twelve by fourteen Inches.
 3. The Cap and Band, which is ten by twelve Inches.
 4. The upper Cap, which is six by seven Inches.
 5. The two main Jambs, which are thirteen by fifteen Inches of Stone.
 6. The half Bands and Posts of nine by seven Inches.
 7. The uppermost half Band, which is small, six by eight Inches.

P L A T E II.

A Plan of the arched Room cut through perpendicularly in the Middle where the Kiln stands, with a Representation of the Kiln.

A A Is the Cut of the Arch.

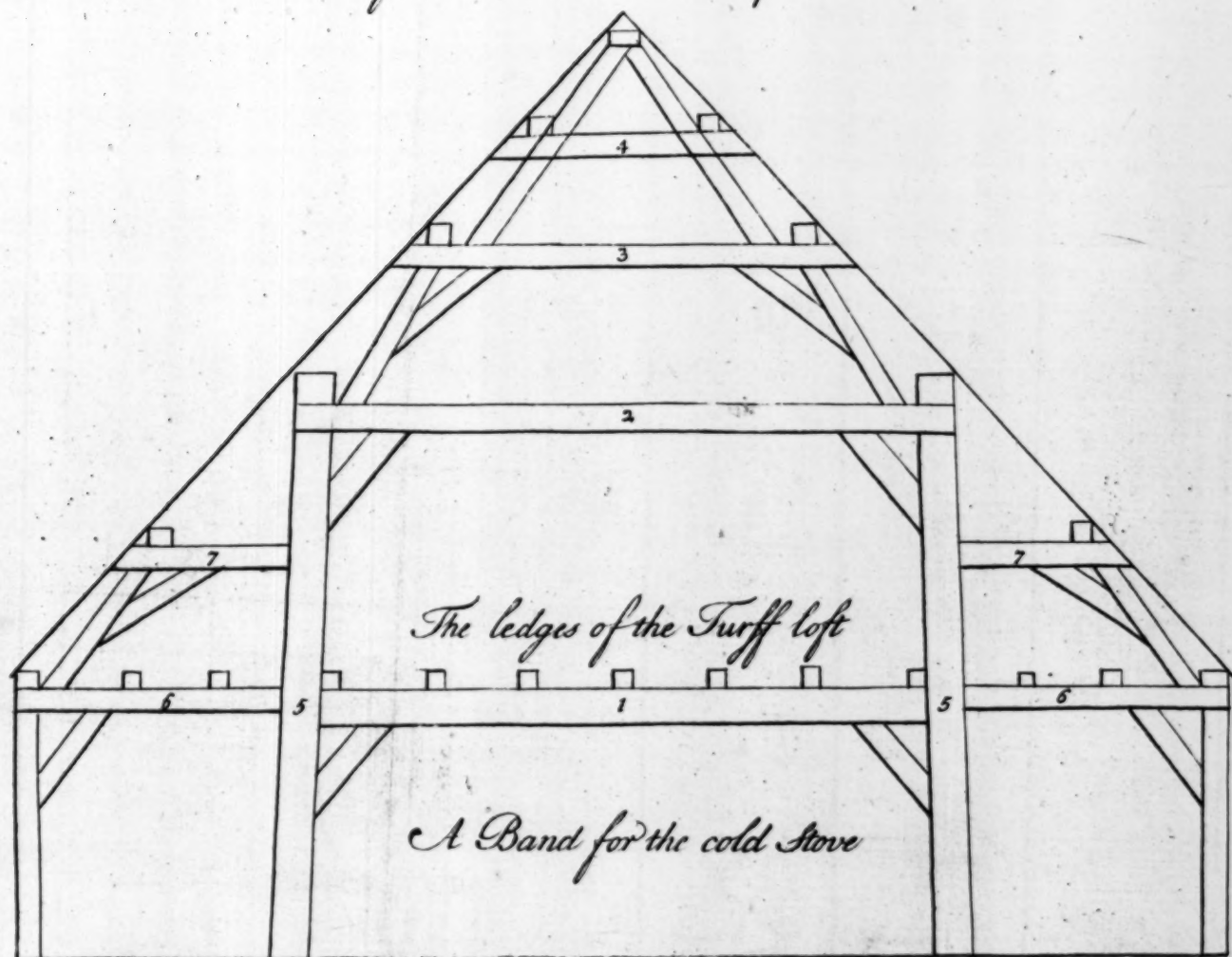
B The Oven of the Kiln which is called the *Hog*; this has no Chimney; when the Fire is first kindled either with Turf or other Fuel, the Smoke is let out through a small Window.

CCC A Stone Foundation on which the Oven and Kiln is built.

CC Is properly the Kiln itself, which must be observed in

A Plan of the Structure of the Cold Stove.

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in what Manner it is built, with little Holes to let out the Heat.

DD Stone Bands made for the greater Firmness, about the Kiln.

EEEE Iron Bars placed to strengthen the Kiln, and also to lay the upper long Lath upon.

F Small cross Laths over the Kiln, which lie from one End C to the other End C upon the Kiln, but there are few of these represented, that the small Holes of the Kiln may better appear.

G The Door of the Entrance.

P L A T E III.

A Plan of the Tower where the Madder is first laid to dry. A Is the Oven of the Tower.

BB The Pipes whereby the Heat spreads itself, is here shewn by the Openings where the Tyles are taken off.

C A Sort of Stairs by which they climb.

DD The Windlafs with its Rope and Hook, to hoist the Madder to the Lofts.

EEEE The four Lofts of the Lath of the Oven.

F The Chimney above the Roof.

G The Door by which they enter.

P L A T E IV.

An Explanation of the Plan of the Section of the Tower.

Fig. 1. 1. 1. 1. The four Bands of the Tower which are sixteen Inches square.

2. The Cap Band ten by twelve Inches.

3. The springing Band six by eight Inches.

4. The Interstice to the Tower six by seven Inches.

Fig. 5. The Spanning Plate five by seven Inches.

6. 6. The lower and second Girder six by seven Inches.

7. The third Girder seven by nine Inches.

8. The fourth Girder six by eight Inches.

9. The fifth Girder six by seven Inches.

10. The Crown Piece of the Tower five by six Inches.

The Ribs in the Tower must be laid fourteen Inches asunder from Middle to Middle Corner-ways, and the Laths between an Inch and a Half distant.

P L A T E V.

A Plan of the Pounding House, in which is shewn at A the Driver, who with his three Horses causes the Mill to turn, which works the Stampers: At B is shewn the Pounder, who with his Shovel continually brings the Madder under the Stampers.

Fig. 1. Is the Beam which supports the Axletree, which is fourteen by fifteen Inches.

2. The hollow Oaken Block or Trough, twenty-seven by twenty-nine Inches.

3. The King Post eighteen Inches square.

4. The upper Band six by seven Inches.

5. The cross Bands five by seven Inches.

6. The cross Arms six by ten Inches.

7. The Swaarden six by ten Inches.

8. The Axis from six to eight Inches.

9. The Feller six by eight Inches of Elm Wood.

10. The King Beam eleven by thirteen Inches of Fir Wood.

11. The Drawers under the Mill five by six Inches.

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12. The Plate for the running of the Truckle three by sixteen Inches.

13. The wooden Knobs to the Wheel of Ash.

14. The Staves made of Box Wood.

15. The six Stampers six Inches square of Ash.

P L A T E VI.

An Explanation of the Section of the Pounding House.

Fig. 1. The under Band sixteen Inches square.

2. The upper Band twelve by fourteen Inches.

3. The Band of the Cap Post ten by twelve Inches.

4. The Springing Band six by seven Inches.

5. The Spanning Plate five by seven Inches.

6. The first Girder six by seven Inches.

7. The second Girder nine by eleven Inches.

8. The third Girder six by eight Inches.

9. The uppermost Girder six by seven Inches.

10. The Top or Cap four by five Inches.

The above Account is the Method of cultivating Madder in *Zealand*, where the best is now produced; to this I shall add, what I have observed of the growing of Madder in other Parts of *Holland*, as also the Experience I have had of the Growth of Madder in *England*, with an Account of the Method of planting it here.

In the Year 1727, I observed a great Quantity of this Plant cultivated in *Holland*, between *Helvoetsluys* and the *Brill*; and it being the first Time I had ever seen any considerable Parcel of it, I was tempted to make some Enquiries about its Culture, and take some Minutes of it down upon the Spot, which I shall here insert, for the Use of such as may have Curiosity to attempt the Culture of it.

In Autumn they plough the Land, where they intend to plant Madder in the Spring, and lay it in high Ridges, that the Frost may mellow it; in *March* they plough it again, and at this Season they work it very deep, laying it up in Ridges 18 Inches asunder, and about a Foot high; then about the Beginning of *April*, when the Madder will begin to shoot out of the Ground, they open the Earth about their old Roots, and take off all the Side Shoots which extend themselves horizontally, just under the Surface of the Ground, preserving as much Root to them as possible; these they transplant immediately upon the Tops of the new Ridges, at about a Foot apart, observing always to do this when there are some Showers, because then the Plants will take Root in a few Days, and will require no Water.

When the Plants are growing, they carefully keep the Ground hoed, to prevent the Weeds from coming up between them; for if they are smothered by Weeds, especially when young, it will either destroy or weaken them so much, that they seldom do well after. In these Ridges they let the Plants remain two Seasons, during which Time they keep the Ground very clean; and at *Michaelmas*, when the Tops of the Plants are decayed, they take up the Roots and dry them for Sale. This is what I could learn of their Method of cultivating this Plant, to which I will subjoin a few Observations of my own, which I have since made upon the Culture of Madder in *England*.

The Land upon which I have found Madder thrive best, is a soft sandy Loam, and if it has been in Tillage some Years, it will be better than that which is fresh

fresh broken up. This should have at least a depth of 2 Feet and a Half, or three Feet of good Earth, and must be quite clear from Couch, or the Roots of any bad Weeds; for as the Roots of Madder should remain three Years in the Ground, so where there are any of those Weeds which spread and multiply at their Roots, they will intermix with the Madder Roots, and in three Years will have taken such Possession of the Ground, as to greatly weaken the Madder, and render it very troublesome to separate when the Madder is taken up.

The Ground should be ploughed deep before Winter, and laid in Ridges to mellow; and if it is not too strong, there will be no Necessity for ploughing it again, till just before the Time of planting the Madder, when the Land should be ploughed as deep as the Beam of the Plough will admit; and there should be Men following the Plough in the Furrows, who should dig a full Spit below the Furrow, and turn it up on the Top; by preparing this Ground of the Depth, the Roots of the Madder will strike down and be of greater Length, in which the Goodness of the Crop chiefly consists. The Land being thus prepared and made level, will be fit to receive the Plants. The best Time for planting the Madder, is about the Middle, or latter End of *April*, according as the Season is more or less forward, which must be determined by the young Shoots; for when these are about two Inches above Ground, they are in the best State for planting.

In taking up these Shoots for planting, the Ground should be opened with a Spade, that they may be separated from the Mother Plants with as much Root as possible; for if the Roots are broken off, they will not succeed: These Plants should be drawn up no faster than they are planted, for if they lie long above Ground, they will shrink and their Tops wither, and then they often miscarry; therefore if they are brought from a distant Place, there should be great Care taken in packing of them up for Carriage; especial Regard should be had not to pack them so close, or in so great Quantity, as to cause them to heat, for that will soon spoil them; but if they are a little withered by lying out of the Ground, their Roots should be set upright in Water for a few Hours, which will stiffen and recover them again.

In planting Madder, there are some who make the Rows but 1 Foot asunder, others 1 Foot and a Half, some two, and others who allow them 3 Feet Distance, I have made Trial of the three last Distances, and have found when the Roots have been left three Years in the Ground, that 3 Feet Distance Row from Row is the best; but if it is taken up in two Years, 2 Feet asunder may do very well; and the Distance in the Rows Plant from Plant, should be one Foot, or a Foot and a Half.

If there is no Danger of the Ground being too wet in Winter, the Plants may be planted on the level Ground; but if on the contrary, the Ground should be raised in Ridges where each Row of Plants is to be set, that their Roots may not reach the Water in Winter, for if they do, it will stop their downright Growth; and this is the Reason for the *Dutch*, who plant Madder in the Low Countries, raising their Ridges so high as 2 or 3 Feet, and in *Zealand*, where the Ground is drier, they

raise the Beds 4 or 5 Inches above the Intervals, that the Wet may drain off from the Beds where the Madder is planted.

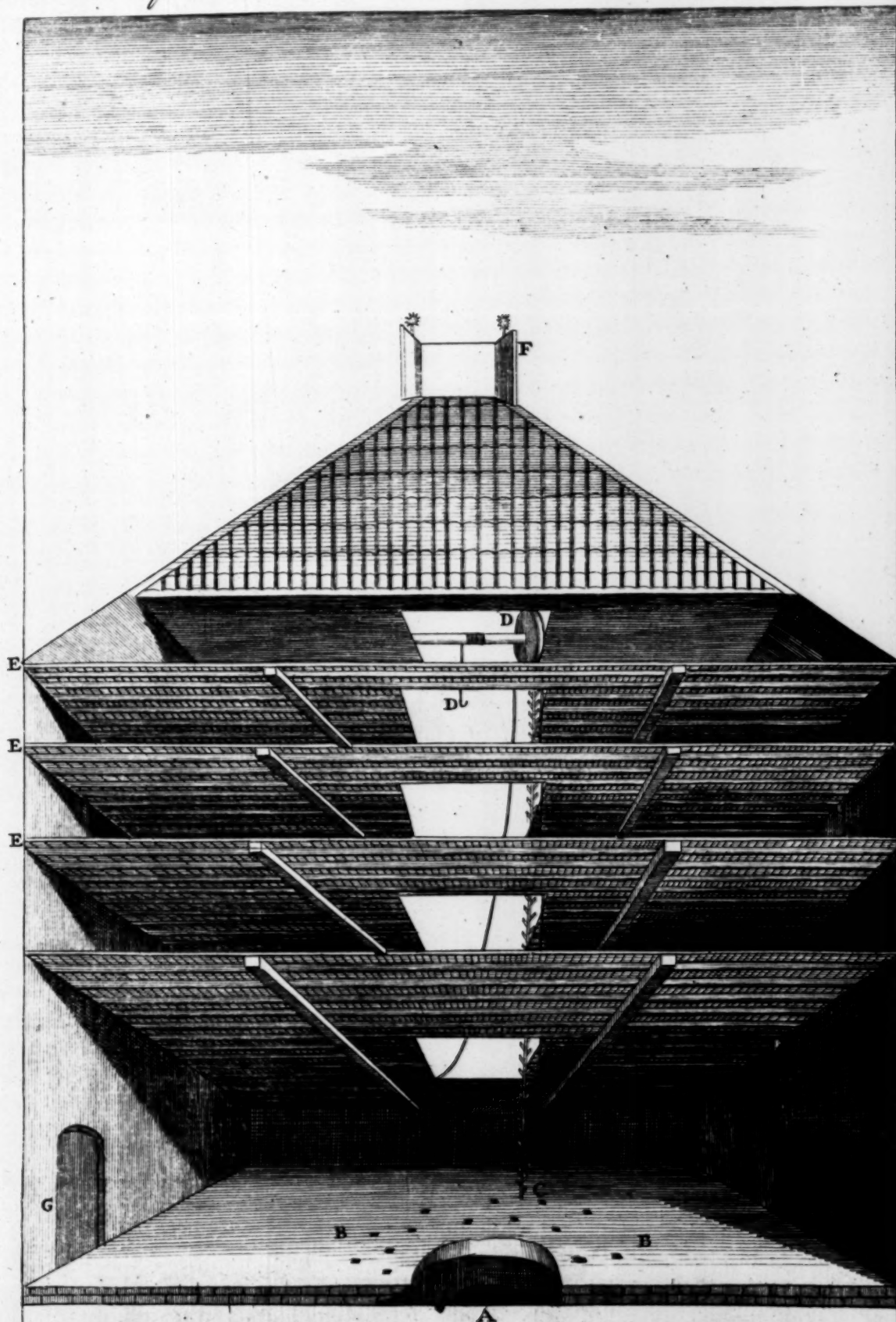
The Method of planting is as follows: *viz.* The Ground being made smooth, a Line is drawn cross it to mark out the Rows, that they may be streight for the more convenient Cleaning, and for the better digging or ploughing the Ground between the Rows; then with an Iron-shod Dibble, Holes are made, at the Distance which the Plants are to stand from each other. The Depth of the Holes must be in Proportion to the Length of the Roots of the Plants, which must be planted the same Depth they had been while they were upon the Mother Plants, for if any Part of the Root is left above Ground, the Sun and Winds will dry them, which will retard the Growth of the Plants; and, should any Part of the green be buried in the Ground, it will not be so well, though, of the two, the latter will be less prejudicial, especially if there is not too much of the green buried. When the Plants are put into the Holes, the Earth should be pressed close to them to secure them from being drawn out of the Ground, for Crows and Rooks frequently draw the new Plants out of the Ground, before they get new Roots, where there is not this Care taken; so that in two or three Days I have known half the Plants on a large Piece of Land destroyed by these Birds.

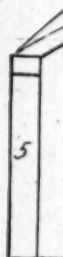
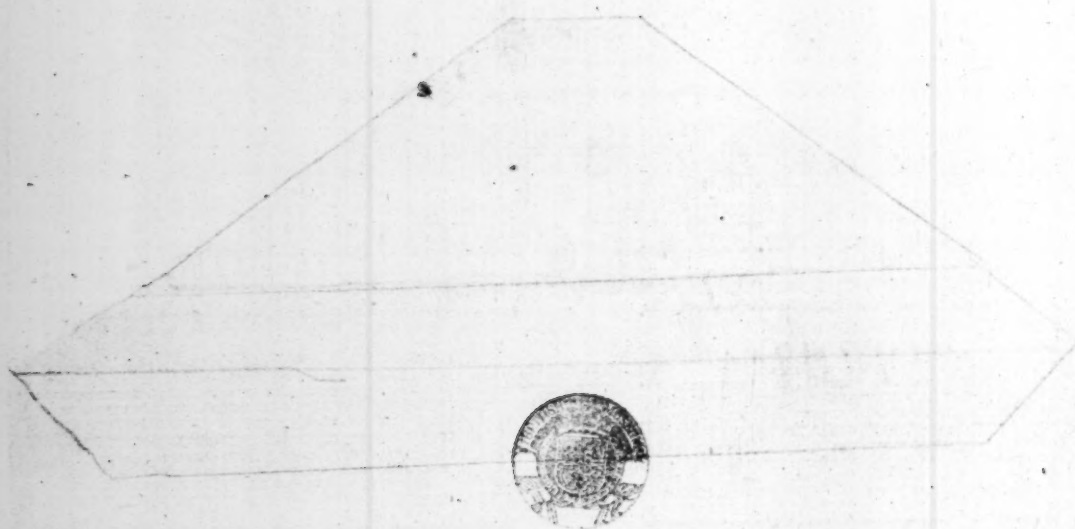
If some Showers of Rain fall in a Day or two after they are planted, it will be of great Service to them, for they will presently put out new Roots, and become strong, so that, if dry Weather should afterward happen, they will not be in so much Danger of suffering thereby, as those which are later planted. There are some who, from a covetous Temper of making most Use of the Ground, plant a Row of Dwarf Peas, or Kidney Beans, between each Row of Madder, and pretend that hereby the Land is kept cleaner from Weeds, but I am very certain the Crop of Madder is injured thereby much more than the Value of those Things which grow between the Rows, as I have experienced; therefore I advise those Persons, who plant Madder never to sow or plant any Thing between the Rows, but to keep the Madder quite clean from Weeds or any other Kind of Vegetable.

In order to keep the Ground thus clean, it should be scuffled over with a *Dutch Hoe*, as soon as the young Weeds appear, when a Man can perform a great Deal of this Work in a Day, and if it is done in dry Weather, the Weeds will die as fast as they are cut down; whereas, when the Weeds are left to grow in the Spring, so as to get Strength, they are not so soon destroyed, and the Expence of hoeing the Ground then will be more than double; besides, there will be Danger of cutting down some of the weaker Plants with the Weeds, if the Persons employed to perform this Work are not very careful, therefore it is much cheaper, as also better for the Madder, to begin this Work early in the Spring, and to repeat it as often as the Weeds render it necessary, for by keeping the Ground thus constantly clean, the Madder will thrive the better.

During the first Summer, the only Culture, which the Madder requires, is that of keeping it clean in the Manner before directed, and, when the Shoots or Haulm of

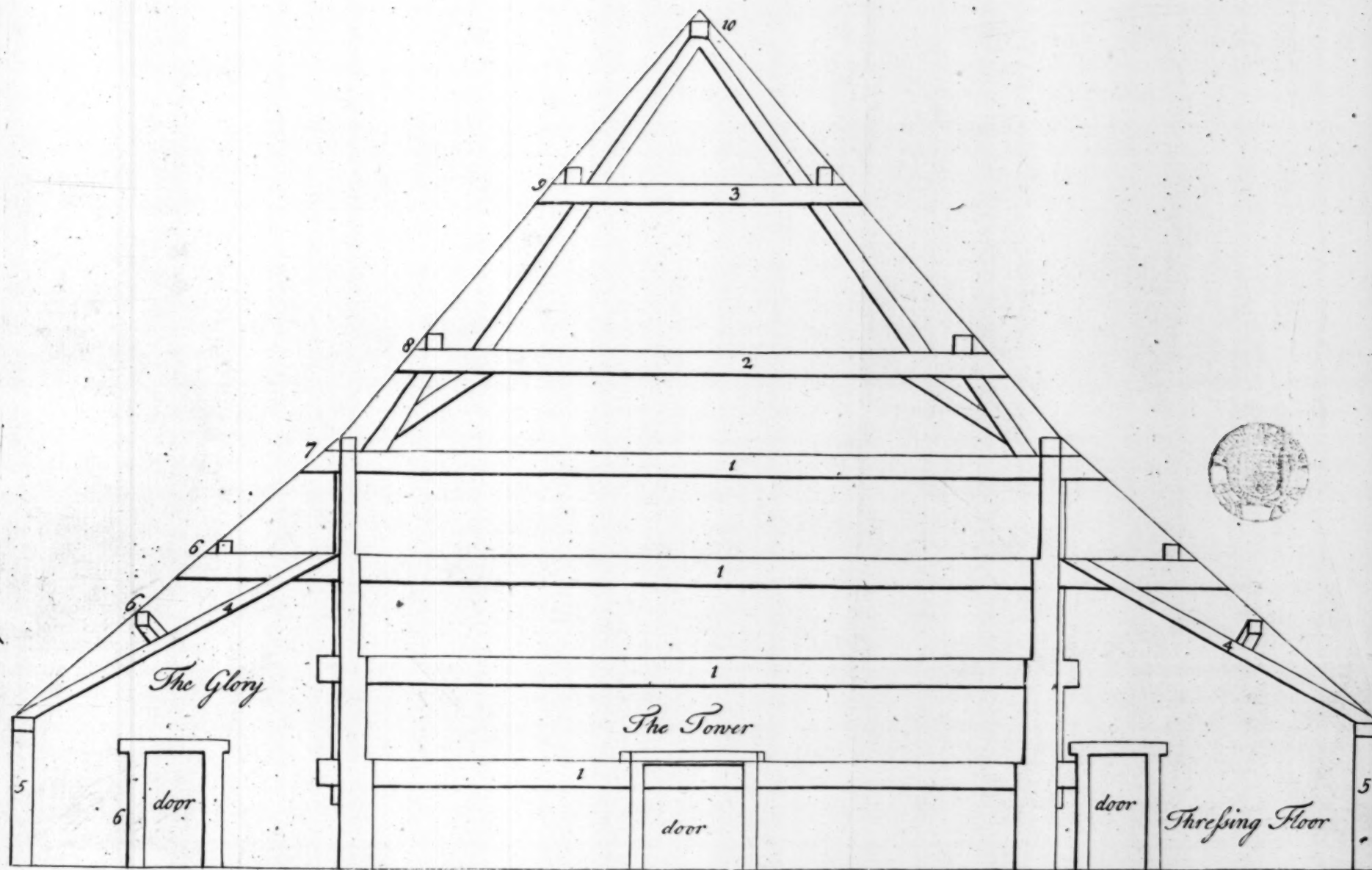
A Plan of the Tower where the Madder is first layed to dry.

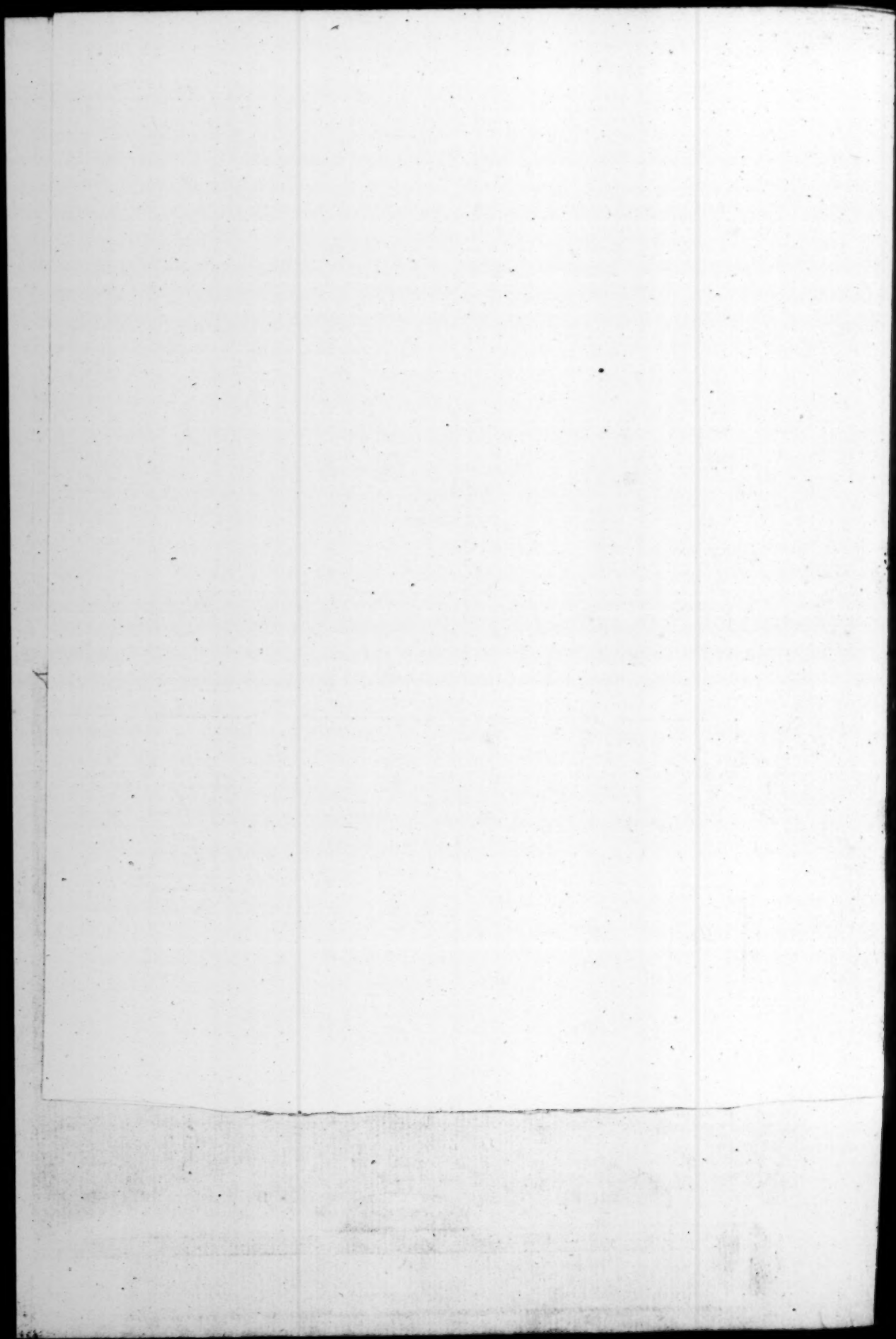




A Section of the Tower

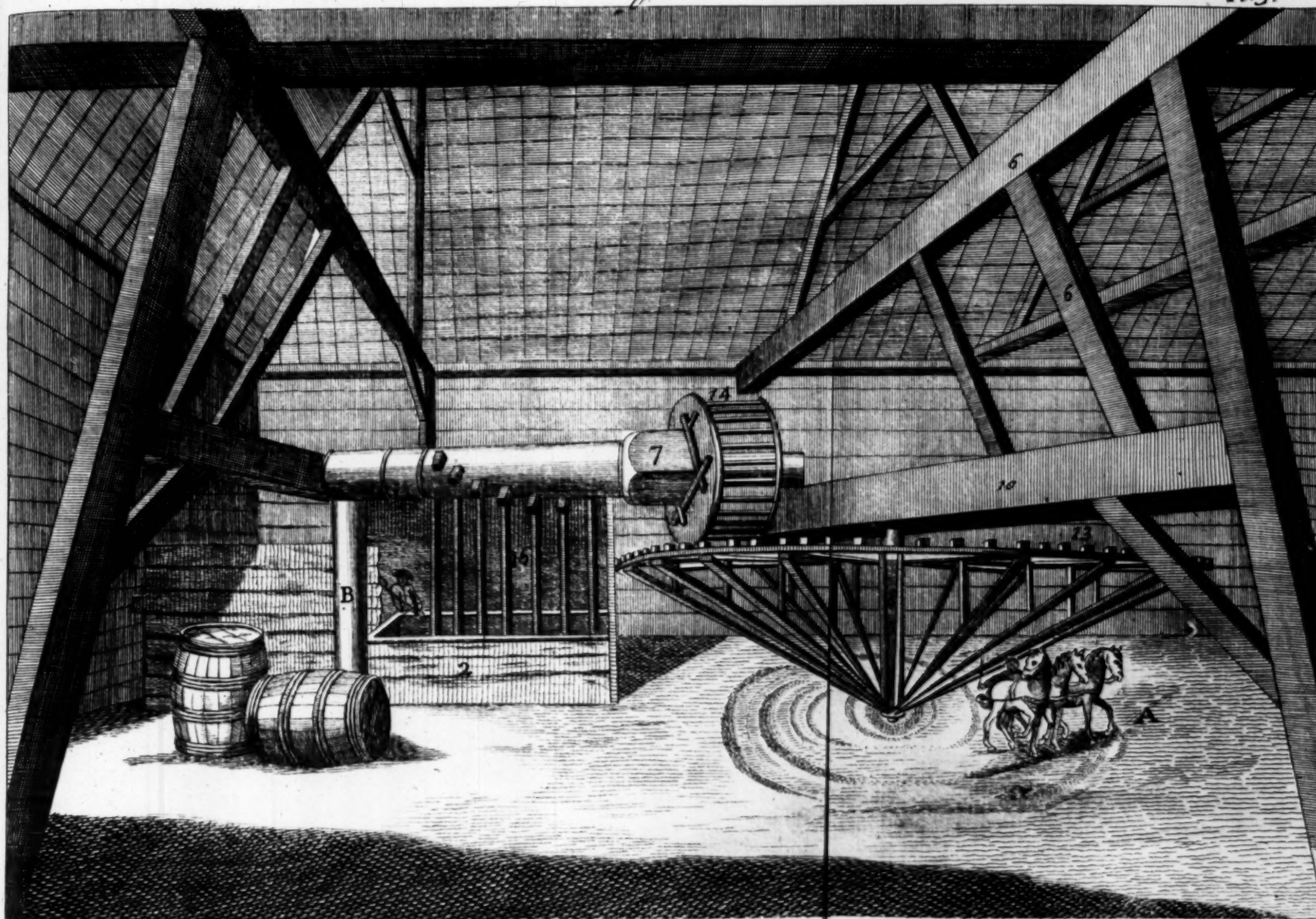
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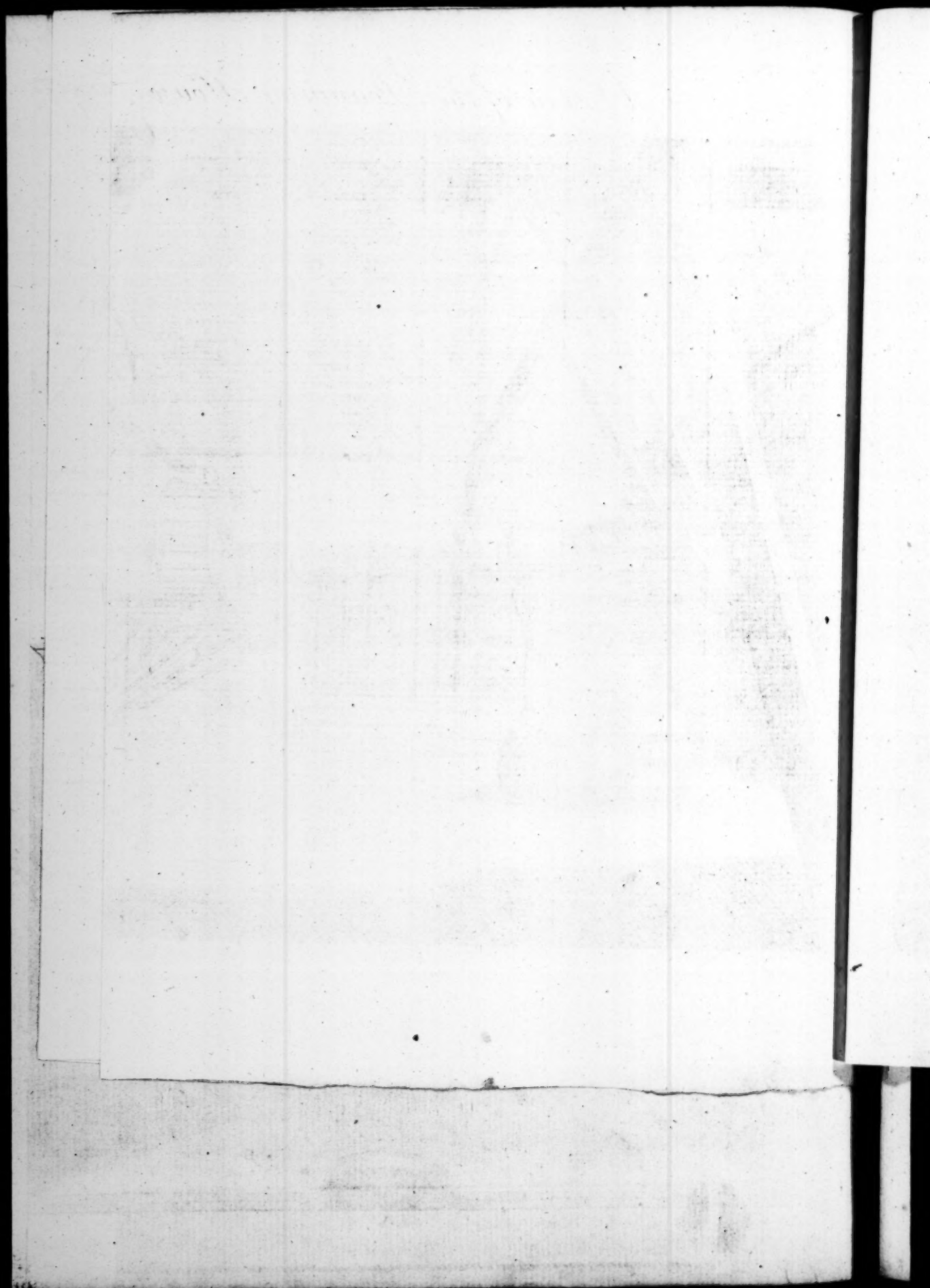




A Plan of the Pounding House.

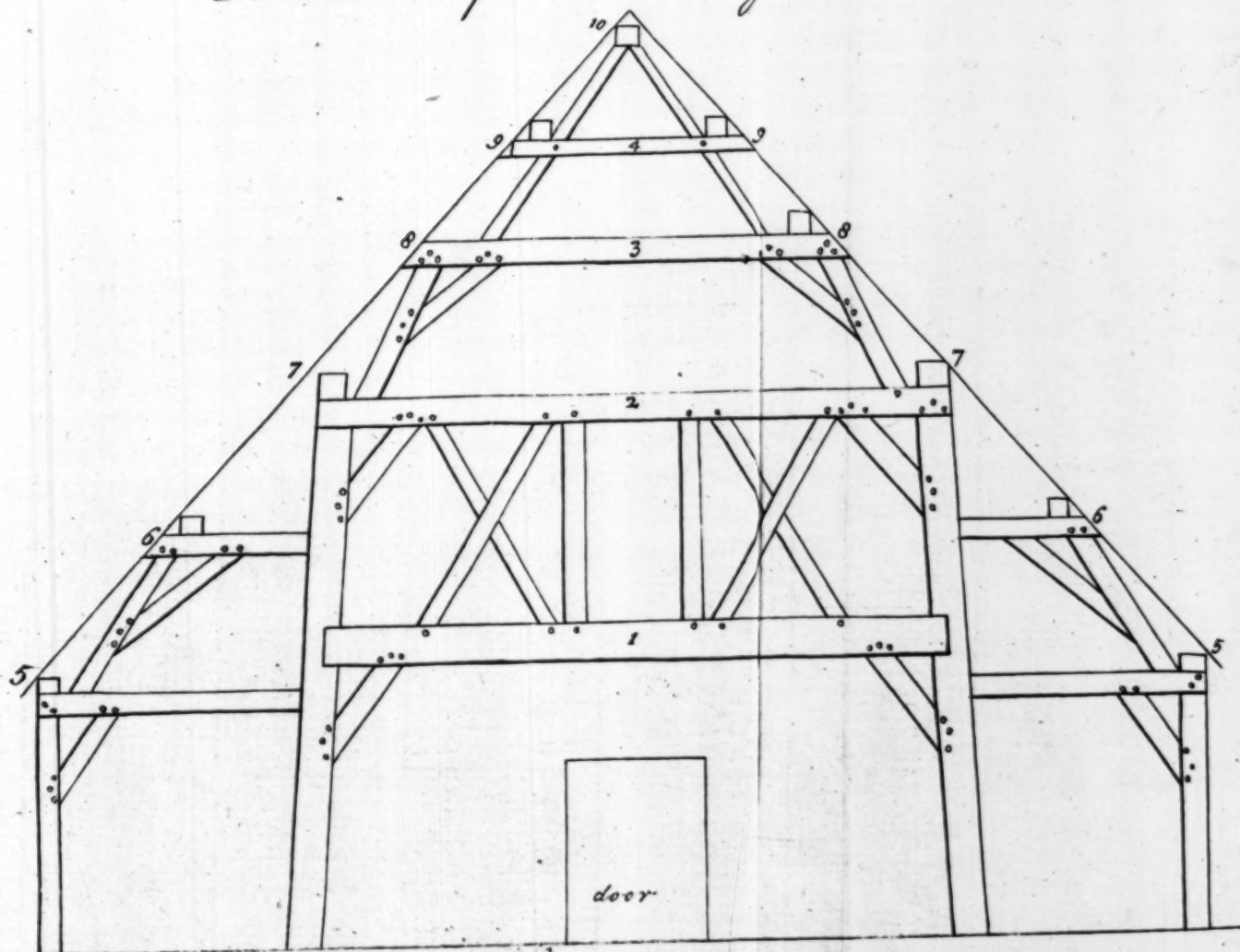
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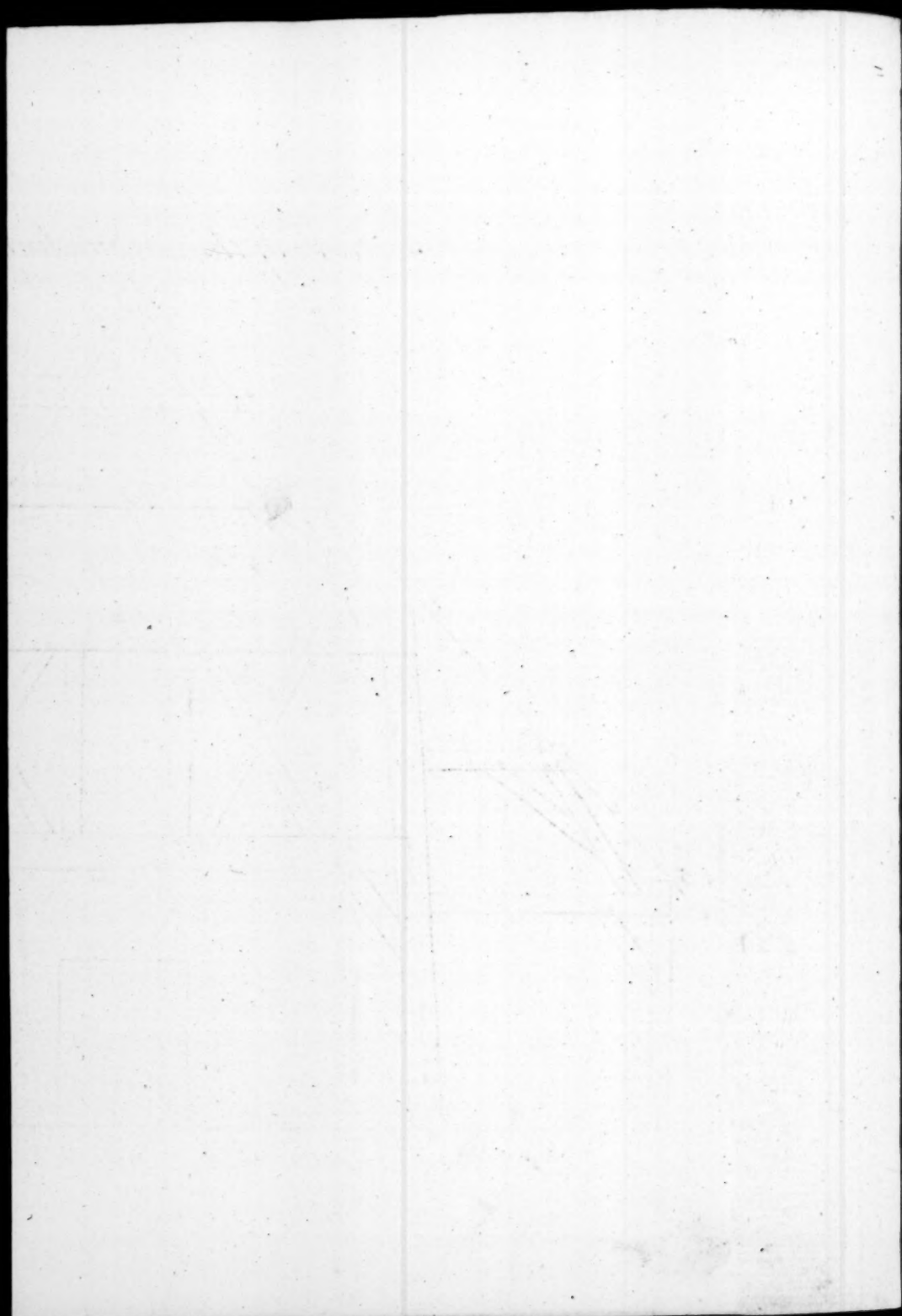




A Section of the Pounding House.

Pl. 6.





of the Plants decay in Autumn, it should be raked off the Ground; then the Intervals between the Rows should be either dug with a Spade, or ploughed with a hoeing Plough, laying up the Earth over the Heads of the Plants in a roundish Ridge, which will be of great Service to the Roots. The *Dutch* cover the Haulm of their Madder with Earth, leaving it to rot upon the Ground; this perhaps may be necessary in their Country to keep the Frost out of the Ground, but, as I have never found that the severest Winters in *England* have injured the Madder Roots, there is not the same Necessity for that Practice here.

The following Spring, before the Madder begins to shoot, the Ground should be raked over smooth, that the young Shoots may have no Obstruction, and, if any young Weeds appear on the Ground, it should be first scuffled over to destroy them, and then raked over smooth; after this the same Care must be taken the following Summer to keep the Ground clean, and, if it is performed by the Hoe Plough, the Earth of the Intervals should be thrown up against the Side of the Ridges, which will earth up the Roots, and greatly increase their Strength; but, before the Ground of one Interval is so hoed, the Haulm of the Plants should be turned over to the next adjoining Interval, and if they are permitted so to lie for a Fortnight or three Weeks, and then turned back again on those Intervals which were hoed, observing first to scuffle the Ground to destroy any young Weeds, which may have appeared since the stirring of the Ground, then the alternate Intervals should be ploughed in like Manner, turning the Earth up against the opposite Sides of the Roots; by this Method the Intervals will be alternately ploughed, and the Plants earthed up, whereby the Ground will be kept clean, and stirred, which will greatly promote the Growth of the Roots, and by this Method the superficial Shoots will be subdued, and the principal Roots greatly strengthened. The following Autumn the Ground should be cleared of the Haulm and Weeds, and the Earth raised in Ridges over the Roots, as in the foregoing Year.

The third Spring the Roots will furnish a great Supply of young Plants, but, before these appear, the Ground should be cleaned and raked smooth, that the Shoots may have no Obstruction to their coming up; and, when the young Plants are fit to take off, it should be performed with Care, always taking off those which are produced at the greatest Distance from the Crown of the Mother Plants, because those are what rob them most of their Nourishment, and the Wounds made by separating them from the old Roots are not near so hurtful as those near the Crown, for the stripping off too many of the Shoots there will retard the Growth of the Plants.

The Culture of the Madder the third Summer must be the same as the second, but, as the Roots will then be much stronger, the Earth should be laid up a little higher to them at the Times when the Ground is clean, and, if all the distant superficial Shoots, which come up in the Intervals are hoed or ploughed off, it will be of Service to strengthen the larger downright Roots, and, as the Haulm will now be very strong and thick, the frequent turning it over from one Interval to another

will prevent its rotting, for if it lies long in the same Position, the Shoots, which are near the Ground, where there will be always more or less Damp, and being covered with the upper Shoots, the Air will be excluded from them, which will cause them to rot, for the Shoots of Madder are naturally disposed to climb upon any neighbouring Support, and in Places where they have been supported, I have seen them more than 10 Feet high, but the Expence of staking the Plants to support their Shoots would be much too great to be practised in general, therefore the other Method of turning the Haulm over from one Interval to the other will be found of great Use, for hereby it is kept from decaying, and by so doing the Sun is alternately admitted to each Side of the Roots, which is of more Consequence to the Growth of the Madder than most People conceive, and from many repeated Trials I have found, that where the Haulm has decayed or rotted in Summer, it has greatly retarded the Growth of the Roots. There have been some ignorant Pretenders who have advised the cutting off the Haulm in Summer, in order to strengthen the Roots, but whoever practises this, will find to their Cost the Absurdity of this Method, for I have fully tried this many Years ago, and have always found that every other Root, upon which this was practised, was at least a third Part smaller than the intermediate Roots, whose Haulm was left entire. The Occasion of my first making this Experiment was, because the Plants had been set too near each other, and the Season proving moist had increased the Number and Strength of the Shoots, so that they were so thick, that many of them began to rot; to prevent which I cut off the Shoots of every other Plant to give Room for spreading the others thinner, but soon after this was done, the Plants produced a greater Number of Shoots than before, but they were weaker, and the Effect it had upon the Roots was as before related, and since then I have frequently repeated the Experiment on a few Roots, and have always found the Effect the same.

As soon as the Haulm of the Madder begins to decay in Autumn, the Roots may be taken up for Use, because then the Roots have done growing for that Season, and will then be plumper and less liable to shrink than if dug up at another Season, for I have always found that Roots of every Kind of Plant, which are taken out of the Ground during the Time of their growing, are very apt to shrink, and loose more than half their Weight in a short Time.

When the Season for digging up the Madder Roots is come, it should be done in the following Manner; viz. A deep Trench should be dug out at one Side of the Ground next to the first Row of Madder to make a sufficient opening to receive the Earth which must be laid therein in digging up the Row of Roots so that it should be at least 2 Feet broad, and two Spits and two Shovelings deep, and should be made as close as possible to the Roots, being careful not to break or cut the Roots in doing it; then the Row of Roots must be carefully dug up, turning the Earth into the Trench before mentioned. In the doing of this there should be to every Person who digs two or three Persons to take out the Roots, that none may be lost, and as much of

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the Earth should be shaken out of the Roots as possible, and after the principal Roots are taken up, there will be many of the long Fibres remaining below, therefore, in order to get the Roots as clean as possible, the whole Spot of Ground should be dug of the same Depth as the first Trench, and the Pickers must follow the Diggers to get them all out to the Bottom. As the digging of the Land to this Depth is necessary, in order to take up the Roots with as little Loss as possible, it is a fine Preparation for any succeeding Crop, and I have always found that the Ground, where Madder has grown, produced better Crops of all Kinds than Land of equal Goodness, which had not the like Culture.

After the Roots are taken up, the sooner they are carried to the Place of drying, the finer will be their Colour, for if they lie in Heaps, they are apt to heat, which will discolour them, or if Rain should happen to wet them much, it will have the same Effect; therefore no more Roots should be taken up than can be carried under Shelter the same Day.

The first Place, in which the Roots should be laid to dry, must be open on the Sides to admit the Air, but covered on the Top to keep out the Wet. If a Building is to be erected new, such as the Tanners have for drying their Skins, will be as proper as any, for these have Weather Boards from Top to Bottom at equal Distances to keep out the driving Rain, but the Spaces between being open admit the Air freely, and if instead of Plank Floors or Stages above each other, they are laid with Hurdles or Basket Work, upon which the Roots are laid to dry, the Air will have freer Passage to the under Side of the Roots, which will dry them more equally.

In this Place they may remain four or five Days, by which Time the Earth, which adhered to the Roots, will be so dry as to easily rub off, which should be done before the Roots are removed to the cold Stove, for the slower the Roots are dried, the less they will shrink, and the better will be the Colour of the Madder, and the cleaner the Roots are from Earth, the better the Commodity will be for Use when prepared.

After the Roots have laid a sufficient Time in this Place, they should be removed into another Build. 7. called the cold Stove, in which there should be Conveniences of Flues passing through different Parts of the Floor and the Side Walls; in this the Roots should be laid thin upon the Floors, and turned from Time to Time as they dry, taking those Roots away, which are nearest to the Flues that convey the greatest Heat, placing them in a cooler Part of the Room, and removing such of them as had been in that Situation to the warmer, from whence the other are taken. The constant Care in this Particular will be of great Service to the Quality of the Madder, for, when this is properly conducted, the Roots will be more equally dried, and the Commodity, when manufactured, will be much fairer and better for Use.

When the Outside of the Roots have been sufficiently dried in this cold Stove, they should be removed to the threshing Floor, which may be the same as in a common Barn where Corn is threshed. The Floor of this should be swept, and made as clean as possible; then the Roots should be threshed to beat off their Skins

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or Outside Coverings; this is the Part which is prepared separately from the inner Part of the Root, and is called *Mull*, which is sold at a very low Price, being the worst Sort of Madder, so cannot be used where the Permanency or Beauty of the Colours are regarded; these Husks are separated from the Roots, pounded by themselves, and are afterward packed up in separate Casks, and sold by the Title of *Mull*. If this is well prepared, and not mixed with Dirt, it may be sold for about 15 Shillings per Hundred Weight, at the Price which Madder now bears, and this, as is supposed, will defray the whole Expence of drying the Crop.

After the *Mull* is separated from the Roots, they must be removed to the warmer Stove, where they must be dried with Care, for if the Heat is too great, the Roots will dry too fast, whereby they will lose much in Weight, and the Colour of the Madder will not be near so bright; to avoid which, the Roots should be frequently turned, while they remain in this Stove, and the Fires must be properly regulated. If some Trials are made by fixing a good Thermometer in the Room, the necessary Heat may be better ascertained than can be done any other Way, but this will require to be greater at some Times than at others, according as the Roots are more or less succulent, or the Weather more or less cold or damp, but it will always be better to have the Heat rather less than over-hot, for, though the Roots may require a longer Time to dry with a slow Heat, yet the Colour will be better.

When the Roots are properly dried in this Stove, they must be carried to the Pounding House, where they must be reduced to Powder in the Manner before related, but whether it is necessary to separate the *Kraps* from the *Gemeens* as is now practised by the *Dutch*, the Consumers of Madder will be better Judges than myself.

There has been some Objections of late mentioned to the introducing or rather retrieving the Culture of Madder in *England*, which it may be proper here to take Notice of, lest they should have so much Weight as to prevent many Persons from engaging in it. The first which has been generally started is, that the Land in this Country is not so well adapted for growing Madder, as that in *Holland*, to which I can with Truth affirm, that there are vast Tracts of Land here much better adapted for producing Madder than the best Land in *Zealand*, and from the Experience, which I have had of its Growth, will produce a greater Crop.

Another Objection which I have heard was the Labour in *Holland* being cheaper than in *England*. The *Dutch* will always undersell us, so consequently will maintain this Branch of Trade, but this is certainly a great Mistake, for, though the Labourers employed in cultivating Madder may not earn so great Wages as is generally paid in *England*, sure I am that the Difference between an expert *English* Labourer and that of the best *Dutchman*, in the ploughing, hoeing, planting, &c. of Madder, is much greater than that of their Pay, for I am sure a good *English* Gardener or Ploughman will do more Business, and perform it better, in four Days, than the best Workman in *Holland* can do in six. What I now say is greatly within Compass from my own Knowledge, so that, supposing we were to proceed in the same Manner now practised by the *Dutch*, this could be no Objection

to

to the cultivating of Madder, but we shall soon find Ways of performing the most laborious Part, at much less Expence, by Means of the hoeing Plough, which may be used to great Advantage in the Cultivation of Madder, whereby the Expence will be much lessened, and, when once this is well established in England, there can be no Doubt but that great Improvements will be made both in the Culture and Method of preparing the Commodity for Use.

There have been Objections made against farther Trials of growing Madder, because some, who have engaged in it, have not succeeded; but in answer to this, it must be observed, that their ill Success was owing to a Want of Skill. Some of them continued to plant repeated Crops of Madder on the same Spot of Ground, till the Roots became so small, as scarce to pay the Expence of digging up, and here it is proper to observe that Madder should not be planted on the same Land, till after an Interval of 7 or 8 Years, during which Interval the Ground may be sown with any Sort of Grain, or Kitchen Vegetables, which it will produce to great Advantage after Madder, because the Land will be wrought so deep. The Dutch always sow Grain upon their Madder Ground in the Intervals of four Years, and have great Crops from it, and they are obliged, from the Scarcity of Land fit for this Purpose, to plant the same Ground after an Interval of 4 Years; but, as we are not under the same Necessity, it will be much better to stay 8, for the Roots of Madder are very similar to those of *Asparagus*, and draw much the same Nourishment from the Ground, and it is well known that, when *Asparagus* Roots are dug up, which have been growing three Years, if the same is planted with *Asparagus* again in a few Years, it will not thrive equal to that which is planted on Ground, upon which *Asparagus* has not grown for several Years, and this is always found to be the Case even in Kitchen Gardens near London, where, by the well working, and frequent dunging the Ground, it may be supposed changed in 3 or 4 Years, more than the Fields can possibly be in 8 or 10.

Madder should not be planted in very rich dunged Land, for in such there will be very large Haulm, but the Roots will not be in Proportion; and, where there is not much Dung or Sea-coal Ashes, the Madder Roots will be of a darker Colour, as it also will, where it is cultivated in the Smoak of London, which is likewise the Case with Liquorice, for that, which grows in a sandy Loam at a Distance from London, is always much brighter and clearer than that, which grows in the rich Lands in the Neighbourhood of London.

If the Cultivation of Madder is carried on properly in England, it will employ a great Number of Hands from the Time Harvest is over, till the Spring of the Year, which is generally a dead Time for Labourers, and hereby the Parishes may be eased of the Poor's Rate, which is a Consideration worthy of publick Attention.

RUBEOLA. See *Asperula*, *Galium*, and *Sherardia*.

RUBUS. *Tourn. Inst. R. H.* 614. *Tab.* 385. *Lin. Gen. Pl.* 557. The Bramble, or Raspberry Bush; in French, *Ronce*.

The Characters are,

The Flower has a permanent Emplacement of 1 Leaf, cut into 5 Spear-shaped Segments; it hath 5 roundish Petals, and a great Number of Stamina inserted in the Emplacement,

the Stamina shorter than the Petals, terminated by roundish compressed Summits, with a great Number of Germina, having small Hair like Styles on the Side of the Germina, crowned by single permanent Stigmas. The Germina afterward become a Berry composed of many Acini collected into a Head, each having one Cell, in which is contained one oblong Seed.

The Species are,

1. *RUBUS foliis quinato-digitatis ternatisque, caule petiolisque aculeatis. Flor. Succ.* 409. Bramble or Blackberry with Hand-shaped Leaves having 5 and 3 Lobes and the Foot Stalk and Branches prickly. *Rubus vulgaris* sive *Rubus fructu nigro. C. B. P.* 479. The common Blackberry.

2. *RUBUS foliis ternatis nudis, caule aculeato. Hort. Cliff.* 192. Bramble with naked trifoliate Leaves and a prickly Stalk. *Rubus repens, fructu casto. C. B. P.* 479. The Dewberry.

3. *RUBUS foliis quinato-pinnatis ternatisque, caule aculeato, petiolis canaliculatis. Flor. Succ.* 408. Bramble with winged Leaves having 5 and 3 Lobes, a prickly Stalk, and channeled Foot Stalks. This is the *Rubus Idæus spinosus. C. B. P.* 479. Prickly Raspberry.

4. *RUBUS foliis ternatis subtus tomentosis, caule glabro. Rasperry* with trifoliate Leaves woolly on their under Side, and a smooth Stalk. *Rubus Idæus levis. C. B. P.* 479. The smooth Rasperry.

5. *RUBUS foliis quinato-pinnatis ternatisque, caule aculeato, petiolis teretibus. Lin. Sp. Pl.* 493. Bramble with winged Leaves having 5 and 3 Lobes, a prickly Stalk, and taper Foot Stalks. *Rubus Idæus fructu nigro, Virginianus. Hort. Elth.* 327. Virginia Rasperry with a black Fruit.

6. *RUBUS foliis simplicibus palmatis, caule inermi multifloro. Hort. Cliff.* 192. Rasperry with single Hand-shaped Leaves, and an unarmed Stalk having many Leaves and Flowers. *Rubus odoratus. Cornut.* 153. Sweet Canada Rasperry, commonly called flowering Rasperry.

7. *RUBUS foliis ternatis nudis, caulibus petiolisque bipidis. Lin. Sp. Pl.* 493. Bramble with naked Leaves growing by Threes, and hairy Stalks and Foot Stalks.

8. *RUBUS foliis ternatis nudis, flagellis repentibus herbaceis. Flor. Succ.* 411. Bramble with naked trifoliate Leaves, and creeping herbaceous Stalks. *Cosmarubus saxatilis. C. B. P.* 110. Dwarf Rock Bramble.

9. *RUBUS foliis ternatis, caule inermi unifloro. Flor. Succ.* 412. Bramble with trifoliate Leaves, and an unarmed Stalk having one Flower. *Rubus humilis flore purpureo. Buxb. Cent.* p. 13. Dwarf Bramble with a purple Flower.

10. *RUBUS foliis simplicibus lobatis, caule unifloro. Flor. Succ.* 413. Bramble with single Leaves having Lobes, and a Stalk bearing one Flower. *Cbameromorus. Clus. Hist.* 118. The Dwarf Mulberry or Cloudberry.

The 1st Sort grows naturally on the Side of Banks, and in Hedges in England, so is not cultivated in Gardens; this is so well known as to need no Description. Of this there are the following Varieties:

1. The common Bramble with white Fruit, which was found in a Hedge near Oxford by Mr. Jacob Bobart. The Branches of this Sort are covered with a light green Bark; the Leaves are of a brighter green than the

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common Sort, and the Fruit is white, but it seldom produces Fruit in Gardens.

2. The Bramble without Thorns; this is in every Respect like the first, but the Branches and Foot Stalks have no Thorns.

3. The Bramble with elegant cut Leaves; this differs from the first by having the Leaves more finely cut.

4. The Bramble with double Flowers; this differs from the first in having very double Flowers, so is frequently planted in Gardens for Ornament.

5. The Bramble with variegated Leaves. This is by some preserved in Gardens, but is very apt to become plain, if planted in good Ground.

These Sorts are easily propagated by laying down their Branches, which will put out Roots at every Joint very freely. They may be transplanted any Time from September to March, and will grow in almost any Soil or Situation.

The 2d Sort hath weaker trailing Stalks than the 1st; the Leaves are trifoliate, and the Lobes larger than those of the other; the Fruit is smaller, the Acini larger, and but few in each, which are of a deeper black Colour. This grows naturally in England, and is known by the Title of Dewberry.

The 3d Sort is the Raspberry, which grows naturally in the Woods in the northern Parts of England, but is cultivated in Gardens for its Fruit, which supplies the Table at the Season when they are ripe. There are 2 or 3 Varieties of this, one with a red, and the other a white Fruit, and the third generally produces two Crops of Fruit annually; the 1st ripens in July, and the 2d in October, but those of the latter Season have seldom much Flavour. These are accidental Varieties, but the 4th Sort I believe to be a distinct Species, for the Leaves are trifoliate, larger than those of the common Sort, woolly on their under Side, and the Branches and Stalks have no Thorns. This produces but few Fruit, and those small, which has occasioned its being neglected.

The Raspberry is generally propagated by Suckers, though I should prefer such Plants as are raised by Layers, because they will be better rooted, and not so liable to send out Suckers as the other, which generally produce such Quantities of Suckers from their Roots, as to fill the Ground in a Year or two; and where they are not carefully taken off, or thinned, will cause the Fruit to be small, and in less Quantities; especially when the Plants are placed near each other, which is too often the Case for there are few Persons who allow these Plants sufficient Room.

In preparing these Plants, their Fibres should be shortened; but the Buds, which are placed at a small Distance from the Stem of the Plant, must not be cut off, because those produce the new Shoots the following Summer. These Plants should be planted about 2 Feet asunder in the Rows, and 4 or 5 Feet Distance Row from Row; for if they are planted too close, their Fruit is never so fair, nor will ripen so kindly, as when they have Room for the Air to pass between the Rows. The Soil in which they thrive best, is a fresh strong Loam, for in warm light Ground they do not produce so great plenty of Fruit; for they naturally grow in

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cold Land, and in Shade; therefore when they are planted in a warm Situation and a light Soil, they do not succeed.

The Season for dressing them is in October, at which Time all the old Wood, that produced Fruit the preceding Summer, should be cut down below the Surface of the Ground, and the young Shoots of the same Year must be shortened to about 2 Feet in Length; then the Spaces between the Rows should be well dug, to encourage their Roots; and if you bury a very little rotten Dung therein, it will make them shoot vigorously the Summer following, and their Fruit will be much fairer. During the Summer Season they should be kept clear from Weeds, which, with the before-mentioned Culture, is all the Management they will require; but it is proper to make new Plantations once in 3 or 4 Years, because when the Plants are suffered to remain long, they will produce few and small Fruit.

The *Virginian* flowering Raspberry, is commonly propagated in the Nurseries as a flowering Shrub. The Flowers of this Sort are as large as small Roses, and there is a Succession of them for two Months or more, so that they make an agreeable Variety during their Continuance. This Sort frequently produces Fruit in England, which are not so large as those of the common Sort, and have little Flavour. These ripen in September or the Beginning of October.

The *Virginian* Raspberry rises with purplish Stalks a little higher than the common Sort; the Leaves are of a lucid green on their upper Side, but hoary on their under; their Foot Stalks are taper; the Fruit is shaped like those of the common Blackberry, and are of a deep black when ripe; the Fruit has little Flavour, so the Plants are never cultivated for their Fruit here. It ripens late in Autumn.

The 8th Sort grows naturally upon rocky Hills in the northern Counties of England, and most of the northern Parts of Europe. This hath trailing herbaceous Stalks, which put out Roots at their Joints, whereby it propagates in Plenty; the Leaves are trifoliate, the Lobes large, and of a lucid green; the Fruit is small, so not worth cultivating.

The 9th Sort grows naturally in Norway, Sweden, and Siberia; this hath an upright Stalk about 3 Inches high, garnished with small trifoliate Leaves; the Stalk is terminated by one purple Flower, which is succeeded by a small red Fruit, having the Scent and Flavour of Strawberries. This Plant grows naturally upon mossy Bogs, so cannot be cultivated to any Purpose on dry Ground, and is preserved in a few Gardens for Variety.

The 10th Sort grows naturally on some of the highest Hills in the North of England and Scotland, also upon high boggy Places in the northern Parts of Europe. This Plant cannot be transplanted into Gardens so as to thrive; the Stalks rise about 6 or 8 Inches high, and are generally garnished with two lobed Leaves, standing at a Distance from each other. The Stalk is terminated by a single Flower, which is succeeded by a small black Fruit, not much unlike that of the Dewberry.

RUDBECKIA. *Lin. Gen. Pl.* 878. *Obeliscotbeca. Vaill. Aët. Par.* 1720. *Bobartia. Pet. Mus.* Dwarf Sunflower, *vulgò.*

The Characters are,
It hath female and hermaphrodite Florets, inclosed in one

one common Empalement, composed of 2 Orders of Leaves, the Scales of which are plain, broad, and short. The Rays or Border of the Flower is composed of female half Florets, stretched out on one Side like a Tongue, and end with 2 or 3 Indentures; these have Germina sitting upon proper Receptacles, but have neither Style or Stamina, and are barren. The hermaphrodite Florets are tubulous, Funnel-shaped, and indented in 5 Parts at the Brim. They have 5 short Hair-like Stamina in each, terminated by cylindrical Summits, and a Germen sitting in the common Empalement, having a slender Style crowned by a reflexed Stigma, divided in two Parts. The Germina afterward become single, oblong, four-cornered Seeds crowned by their proper Cup, which has four Indentures.

The Species are,

1. *RUDBECKIA foliis indivisis spatulato-ovatis; radii petalis emarginatis.* Lin. Sp. Pl. 907. *Rudbeckia* with oval, Spattle-shaped, undivided Leaves, and the Petals of the Rays indented. *Chrysanthemum helonii folio, umbone floris grandiuscula prominente.* Pluk. Alm. 99. Tab. 242. Corn Marygold with an Elecampane Leaf, and a large prominent Middle to the Flower, commonly called Dwarf American Sunflower.

2. *RUDBECKIA foliis lanceolato-ovatis alternis indivisis, petalis radii bifidis.* Flor. Virg. 104. *Rudbeckia* with oval, Spear-shaped, undivided Leaves, placed alternate, and the Petals of the Ray bifid. *Chrysanthemum Americanum, doronicifolio, flore perfici coloris, umbone magno prominente ex atro purpureo viridi & aureo fulgente.* Pluk. Alm. 99. American Corn Marygold with a Leopards bane Leaf, a Peach-coloured Flower, and a large prominent Middle of a dark purple, green, and shining Gold Colour, commonly called Dwarf Carolina Sunflower.

3. *RUDBECKIA foliis inferioribus trilobis, superioribus indivisis.* Hort. Upsal. 269. *Rudbeckia* with under Leaves having three Lobes, and the upper ones entire. *Chrysanthemum cannabinum Virginianum bifidum, disco magno, petalis aureis radiato.* Pluk. Alm. 100. Tab. 22. fig. 2. *Virginian Hemp Agrimony*, with a large Disk to the Flower, and the Petals of the Rays of a Gold Colour.

4. *RUDBECKIA foliis inferioribus compositis acutè dentatis, caulinis simplicibus integris dentatisque.* *Rudbeckia* with compound, indented, lower Leaves, those upon the Stalks single, entire, and indented. *Corona foliis amplioribus laciniatis.* Tourn. Inst. R. H. 490. Sunflower, with large jagged Leaves.

5. *RUDBECKIA foliis omnibus quinatis, acutè dentatis exterioribus trilobatis.* *Rudbeckia* with all the Leaves composed of 5 Lobes sharply indented, and the outer ones divided into 3. *Corona foliis foliis angustioribus laciniatis.* Tourn. Inst. R. H. 490. Sunflower with narrower jagged Leaves.

6. *RUDBECKIA foliis inferioribus compositis caulinis quinatis ternatisque, summis simplicibus.* *Rudbeckia* with compound lower Leaves, those on the Stalks quinquelobate and trifoliate, and the Top ones single. *Obelisco-ibeca petalis florum perangustis longis, foliis digitatis, caule glabro ferrugineo.* Amman. Sunflower with long narrow Petals to the Flower, Hand shaped Leaves, and a smooth Iron-coloured Stalk.

The 1st Sort grows naturally in *Virginia*, and several other Parts of *North America*. The Root of this will continue 4 or 5 Years, but unless there is Care taken to

shelter it in Winter, the Plants are often destroyed by Cold or too much Wet. This Sort sends out Heads, by which it may be propagated; the Leaves are oblong, oval, and hairy; the Stalks rise a Foot and a Half high, and have one or two Leaves near the Bottom. The Foot Stalk which supports the Flower, is naked near a Foot in Length, and terminated by one pretty large yellow Flower, shaped somewhat like the Sunflower, from whence it was titled, Dwarf Sunflower. The Petals or Rays of the Flower are very stiff, and are slightly indented at their Points; the Middle or Disk is very prominent, pyramidal, and of a dark purple Colour. These Flowers are of long Duration, for I have frequently observed one Flower continue in Beauty near 6 Weeks, and as the Plants produce many Flowers, there is a Succession of them on the same Plant, from the Middle of July till the Frost puts a Stop to them, which renders them more valuable. This Sort will sometimes produce good Seeds in *England*, when the Seasons are very favourable; but they are generally propagated here by Offsets or Slips, unless when good Seeds can be procured from *America*. The Best Time to separate the Offsets is in the Spring, because the Plants continue to flower so late in Autumn, as to render it impracticable to perform it in the Spring till it is late, so that the Slips will flower but weak the same Year. The Plants will live abroad in the open Air through the Winter, if they are planted in a dry Soil and a warm Situation; but it will always be prudent to shelter two or three Plants under a common hot Bed Frame in Winter to preserve the Kind, because in very severe Winters they are often killed.

The 2d Sort grows naturally in *Carolina*, and also in *Virginia*. This is a perennial Plant like the former, but very rarely produces Seeds in *England*; nor do the Plants put out Heads whereby it may be propagated like the other, so that it is at present not very common here. The Leaves of this Sort are longer and broader than those of the other, and smooth, having three Veins; the Stalks which support the Flowers are taller, and have 2 or 3 narrow Leaves on each, placed alternate: On the Top is one Flower with long narrow Peach-coloured Petals, reflexed downward; the Middle or Disk is very prominent, and of a dark purple but the Summits being of a Gold Colour, add a Lustre to the other. This Sort may be treated as the other; it flowers at the same Season, but the Flowers are not of so long Duration as those of the Former.

The 3d Sort grows naturally in several Parts of *North America*; this is a biennial Plant, which in warm Summers perfects its Seed in *England*; the lower Leaves of this Sort are divided into 3 Lobes, but those on the Stalks are undivided; they are hairy, and shaped like those of the first Sort; the Stalks branch out on their Sides, and are better garnished with Leaves than either of the other. The Flowers are very like those of the first Sort, but smaller; the Plants will live through the Winter in the open Air in mild Seasons, and may be propagated by Slips or Heads; but the best Way is to raise the Plants from Seeds, because they will flower much better than such as are procured by Slips; the second Year the seedling Plants will flower, and produce ripe Seeds.

The 4th Sort grows naturally in most Parts of *North America*,

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America, and has been long an Inhabitant in European Gardens, where it was generally known by the Title of Sun-flower. The Root of this is perennial, but the Stalk annual; the lower Leaves are composed of 5 broad Lobes, deeply cut into acute Points, and some of them are jagged almost to the Mid-rib; the outer Lobes is frequently cut into 3 deep Segments. The Stalks rise 7 or 8 Feet high, and divide upward into several Branches; they are smooth, green, and garnished with single Leaves, oval and Heart-shaped; some of these are indented on their Edges, others entire. The Foot Stalks which sustain the Flowers are naked, terminated by a single Flower with yellow Petals or Rays, shaped like those of the Sunflower, but smaller. This does not produce Seeds here but is easily propagated by parting the Roots, in the same Manner as the perennial Sunflower. It is very hardy in Respect to Cold, but loves a moist Soil.

The 5th Sort has a perennial Root like the former, and is a native of the same Country. This hath smooth green Stalks, which rise higher than those of the former; the Leaves are all composed of 5 Lobes, which are much narrower and end with sharper Points than those of the former, and are very acutely indented on their Sides. The Flowers are smaller, and the Petals narrower than those of the former Sort, but appear at the same Season. It is equally hardy with the former, and may be propagated the same Way.

The 6th Sort grows naturally in North America, and in Siberia, from both which Countries I have received the Seeds. This hath a perennial Root like the two former, the Leaves at Bottom are composed of 7 or 9 Lobes, some entire, and others jagged to the Mid-rib, they are of a dark green and smooth; the Stalks rise 6 Feet high, and divide into many Branches. They are of a purple or Iron Colour, and very smooth; these are garnished with Leaves, which toward the Bottom are Hand-shaped and composed of 5 Lobes; higher up they have but 3, and at the Top the Leaves are single. The Flowers are smaller than those of the 2 former Sorts, but of the same Shape and Colour.

These three last mentioned Sorts may be propagated in plenty, by parting their Roots; the best Time for this is in October, when their Stalks begin to decay; for if they are removed in the Spring, they will not produce many Flowers the same Year. They love a moist Soil, and should be allowed Room for if too near other Plants, they will rob them of their Nourishment and destroy them. They are proper Furniture for large Gardens, where they may be allowed Room, or in Walks round Fields, because they require little Culture.

RUELLIA. Plum. Nov. Gen. 12. Tab. 2. Lin. Gen. Pl. 702.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, cut into 5 narrow acute Segments at the Top, which are erect. It has 1 Petal, with a Tube the Length of the Cup, which spreads and inclines at the Neck, but the Brim spreads open, where it is cut into 5 Segments; the 2 upper being large and reflexed. It hath 4 Stamina situated in the spreading Part of the Tube, connected in Pairs, terminated by short Summits, and a roundish Germen supporting a slender Style, crowned by a bifid Stigma. The

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Germen afterward becomes a taper Capsule, pointed at each End, having 2 Cells, inclosing roundish compressed Seeds. The Species are,

1. RUELLIA foliis ovatis crenatis, pedunculis bifloris. Ruellia with oval crenated Leaves, and Foot Stalks bearing two Flowers. Ruellia humilis, flore caeruleo, asphodeli radice. Plum. Nov. Gen. 12. Dwarf Ruellia, with a blue Flower and an Asphodel Root.

2. RUELLIA foliis petiolatis, floribus verticillatis subsessilibus. Hort. Upsal. 178. Ruellia with Leaves having Foot Stalks, and Flowers growing in Whorls sitting close to the Stalks, Ruellia strepens, capitulis comosis. Hort. Elth. 328. Snapping Ruellia with hairy Heads.

3. RUELLIA foliis petiolatis, pedunculis longis subdivisis nudis. Lin. Hort. Upsal. 179. Ruellia with Leaves having Foot Stalks, and long naked Foot Stalks to the Flowers, which are divided. Ruellia capsulis teretibus. Hort. Elth. 328. Ruellia with taper Capsules.

4. RUELLIA foliis subcrenatis lanceolato-ovatis, capitulis ovatis, foliolis hispidis. Lin. Sp. P. 635. Ruellia with oval Spear-shaped Leaves somewhat crenated, oval Pods, and prickly hairy small Leaves.

The 1st Sort grows naturally in many of the Islands in the West-Indies; the Roots of this are composed of many swelling fleshy Tubers, which run deep into the Ground, and are like those of the Day Lilly, but are smaller. The Stalk rises about 4 or 5 Inches high, and sends out 2 or 3 short Side Branches, garnished with Leaves placed opposite; some of these are small and shaped like a Spatula, others are much larger; they have short Foot Stalks, and are little crenated on their Edges. The Flowers are produced on the Side, and at the End of the Stalk; those on the Side, have 2 Flowers upon each Foot Stalk, which come out opposite at each Joint, but those at the Top sustain 3. The Flowers have narrow Tubes about an Inch long, then they spread out to a Sort of Bell Shape, and at the Top are cut into 5 obtuse Segments, which are large and spread open; they are of a fine blue, but of short Duration, each Flower seldom lasting in Beauty one Day; after the Flower fades, the Germen becomes a taper Pod one Inch and a Half long, having two Cells, which, when ripe, burst with a Touch, and cast out the Seeds to a Distance. It flowers in July, and the Seeds ripen the Beginning of September.

The 2d Sort grows naturally in Carolina; the Root of this is fibrous and perennial; the Stalks rise about a Foot high, are four cornered, and have two longitudinal Furrows, one on each Side; the Joints are 3 or 4 Inches asunder, at each stand 2 oval Leaves, upon very short Foot Stalks. The Flowers come out from the Wings of the Leaves on each Side, two or three rising from the same Point, sitting very close to the Stalks; they are small and of a pale purple Colour, but very fugacious; they open early in the Morning, but are gone by 10 or 11 o'Clock in the Forenoon; these are succeeded by short taper Pods, surrounded by the hairy Segments of the Empalement. It flowers and perfects its Seeds about the same Time as the former.

The 3d Sort grows naturally in the West-Indies; this hath a perennial Root, composed of many fleshy Fibres; the Leaves and Stalks lie close to the Ground; the Stalks grow 5 or 6 Inches high; the Leaves are placed by

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by Pairs at each Joint; they are 2 Inches long, and 1 and a Quarter broad, standing on Foot Stalks half an Inch long. The Foot Stalks which sustain the Flowers are naked, and divide into two smaller, each sustaining one small purple Flower, which is very fugacious; their Empalements are cut into very narrow Segments to the Bottom. After the Flowers are past, the Germen becomes a taper Capsule about an Inch long, including roundish compressed Seeds.

The 4th Sort grows naturally in both Indies; I received the Seeds of this from Carthage in New Spain. This hath a ligneous creeping Root, the Stalks rise about 5 or 6 Inches high, they are single, taper, and jointed; the Leaves are oval, Spear-shaped, and have very short Foot Stalks; they are a little waved on their Edges, are hairy, and curled. The Flowers are produced from the Side of the Stalk, at their Joints; these sustain one small yellow Flower, coming out between rough, hairy, small Leaves. It flowers in July, and the Seeds ripen in September.

These Plants are propagated by Seeds, which must be sown early in Spring in Pots filled with light rich Earth, and plunged into a moderate hot Bed; and when the Plants come up, they must be transplanted each into a separate small Pot filled with rich Earth, and plunged into a hot Bed of Tanners Bark, where they must be shaded from the Sun, until they have taken new Root; after which Time they must have free Air admitted to them every Day in warm Weather, and be constantly watered three or four Times a Week during the Summer Season. If the Plants thrive well, those of the 1st and 3d Sorts will produce Flowers the July following, and perfect their Seeds in August; but the Roots will continue, provided they are plunged into the Bark Bed in the Stove, and kept in a moderate Temperature of Heat.

The 2d Sort is not a Plant of long Continuance, seldom abiding longer than 2 Years; but if it is treated as the two other, it will ripen Seeds the second Year, so may be propagated easily.

The 4th Sort does not so constantly produce Seeds as the three others, so is not so common in England at present. This requires the same Treatment as the other Sorts.

If the Seeds of these Sorts are permitted to scatter in the neighbouring Pots, the Plants will come up without Care, so may be transplanted into Pots filled with fresh loamy Earth, and plunged into the Tan Bed.

RUMEX. Lin. Gen. Pl. 407. *Lapathum*. Tourn. Inst. R. H. 504. Tab. 287. Dock.

The Characters are,

The Empalement of the Flower is permanent, composed of 3 obtuse reflexed Leaves. The Flower has 3 Petals which are larger than the Empalement, to which they are very like. It hath 6 short Hair-like Stamens, terminated by erect Twin Summits, and a three cornered Germen supporting 3 Hair-like reflexed Styles, thrusting out of the Clefts of the Petals, crowned by large jagged Stigmas. The Germen becomes a three-cornered Seed, included in the Petals of the Flower.

The Species are,

1. RUMEX floribus hermaphroditis, valvulis integerimis, foliis oblongo-lanceolatis. Dock with hermaphrodite

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Flowers having entire Valves, and oblong Spear-shaped Leaves. *Lapathum hortense, folio oblongo, five secundum Dioscoridis*. C. B. P. 114. Garden Dock with an oblong Leaf, commonly called Patience, or Patience Rhubarb.

2. RUMEX floribus hermaphroditis, valvulis integerimis graniferis, foliis cordatis obtusis. Rumex with hermaphrodite Flowers having entire Valves bearing Grains, and obtuse Heart-shaped Leaves. *Lapathum folio rotundo Alpinum*. J. B. 2. 987. Round leaved Alpine Dock, called Monks Rhubarb.

3. RUMEX floribus hermaphroditis pedicellatis, foliis lanceolatis longissimis. Rumex with hermaphrodite Flowers growing on small Foot Stalks, and the longest Spear-shaped Leaves. *Lapathum aquaticum, folio cubitali*. C. B. P. 116. Water Dock with a Leaf a Cubit long, commonly called Herba Britannica.

4. RUMEX floribus hermaphroditis, valvulis dentatis graniferis, foliis cordato-oblongis. Hort. Cliff. 138. Rumex with hermaphrodite Flowers, indented Grain-bearing Valves, and oblong Heart-shaped Leaves. *Lapathum folio acuto, plano*. C. B. P. 115. Plain sharp-pointed Dock.

5. RUMEX floribus hermaphroditis, valvulis integerimis graniferis, foliis lanceolatis undulatis acutis. Lin. Sp. 335. Rumex with hermaphrodite Flowers, entire Grain-bearing Valves, and acute Spear-shaped waved Leaves. *Lapathum folio acuto, crispo*. C. B. P. 115. Curled sharp-pointed Dock.

6. RUMEX floribus hermaphroditis, valvulis integerimis, unica granifera foliis cordato-lanceolatis. Hort. Cliff. 138. Rumex with hermaphrodite Flowers, entire Valves, one only bearing a Seed, and Heart-formed Spear-shaped Leaves. *Lapathum folio acuto rubente*. C. B. P. 114. The bloody Dock.

7. RUMEX floribus hermaphroditis verticillatis, valvulis acutè dentatis, foliis lanceolatis. Rumex with hermaphrodite Flowers growing in Whorls, acutely-indented Valves, and Spear-shaped Leaves. *Lapathum folio acuto, flore aureo*. C. B. P. 114. Sharp-pointed Dock with a golden Flower.

8. RUMEX floribus hermaphroditis, valvulis dentatis, foliis cordato-oblongis, obtusiusculis crenulatis. Lin. Sp. 335. Rumex with hermaphrodite Flowers, indented Valves, and blunt oblong Heart-shaped Leaves. *Lapathum vulgare, folio obtuso*. J. B. 2. 985. Common broad-leaved Rumex, or Butter Dock.

9. RUMEX floribus hermaphroditis, foliis lyratis. Guet. Stamp. 1. p. 7. Rumex with hermaphrodite Flowers, and Lyre-shaped Leaves. *Lapathum pulchrum Bononiense sinuatum*. J. B. 2. 988. The Fiddle Dock.

10. RUMEX floribus hermaphroditis, valvulis dentatis graniferis, foliis linearibus. Lech. Scan. 26. Rumex with hermaphrodite Flowers, indented Grain-bearing Valves, and linear Leaves. *Lapathum aquaticum luteolæ folio*. Bocc. Mus. 2. Tab. 184. Water Dock with a Weld Leaf.

11. RUMEX floribus hermaphroditis pedunculis longioribus, valvulis profundè dentatis, foliis cordato-oblongis. Rumex with hermaphrodite Flowers growing upon longer Foot Stalks, Valves deeply indented, and oblong Heart-shaped Leaves. *Lapathum chalcipense folio acuto, seminum involucri profundè dentatis*. Mor. Hist. 2. 58. Aleppo Dock with an acute Leaf, and the Covers of the Seeds deeply indented.

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12. *RUMEX floribus hermaphroditis, valvulis trifido fectacis, unica granifera.* Hort. Upsal. 89. *Rumex* with hermaphrodite Flowers and bristly three-pointed Valves, one of which bears the Seed. *Lapathum Ægyptiacum innum, parietariae folio, capsulae seminis longius barbatâ.* Hort. Piss. Annual Egyptian Dock with a Pellitory Leaf, and long Beards to the Seed Vessels.

13. *RUMEX floribus hermaphroditis valvulis lævibus, caule arboreo, foliis subcordatis.* Vir. Cliff. 32. *Rumex* with hermaphrodite Flowers, smooth Valves, a Tree-like Stalk, and Leaves which are almost Heart shaped. *Acetosa arborefcens subrotundo folio, ex insulis fortunatis.* Pluk. Phyt. Tab. 252. fig. 3. Tree Sorrel from the Fortunate Islands, with a roundish Leaf.

14. *RUMEX floribus hermaphroditis, valvulis dentatis nudis planis reflexis.* Hort. Upsal. 90. *Rumex* with hermaphrodite Flowers, and plain, naked, indented, reflexed Valves. *Acetosa ocyimi folio, Neopolitana.* C. B. P. 114. Naples Sorrel with a Basil Leaf.

15. *RUMEX floribus hermaphroditis geminatis, valvularum alis maximis membranaceis reflexis, foliis indivisis.* Hort. Cliff. 130. *Rumex* with hermaphrodite Flowers growing by Pairs, very large membranaceous Wings to the Valves reflexed, and undivided Leaves. *Acetosa Americana foliis longissimis pediculis donatis.* C. B. P. 114. American Sorrel, with very long Leaves having Foot Stalks.

16. *RUMEX floribus hermaphroditis distinctis, valvularum alis maximis membranaceis, foliis erosis.* Flor. Leyd. Prod. 230. *Rumex* with hermaphrodite Flowers growing on distinct Spikes, very large membranaceous Wings to the Valves, and Leaves appearing as if bitten *Acetosa Ægyptia roseo seminis involucri, folio lacero.* Lipp. Egyptian Sorrel with a Rose-coloured Cover to the Seed, and a torn Leaf.

The 1st Sort was formerly much more cultivated in the English Gardens than at present; this has been generally used for the Monks Rhubarb, and has been thought the true, but others suppose the 2d Sort should be used as such; the Herb was formerly used in the Kitchen, by the Title of Patience. The Root is large, and divides into many thick Fibres, which run downward; their outer Cover is brown, but they are yellow within, with some reddish Veins; the Leaves are broad, long, and acute-pointed; their Foot Stalks are of a reddish Colour; the Stalks rise 4 Feet high, and divide toward the Top into several erect Branches, garnished with a few narrow Leaves, terminating with loose Spikes of large stameneous Flowers. These appear in June, and are succeeded by pretty large three-cornered Seeds whose Coverings are entire, which ripen in Autumn.

The 2d Sort grows naturally on the Alps, but has been long cultivated in the English Gardens. This hath large Roots, which spread and multiply by their Offsets; they are shorter and thicker than those of the first Sort, of a very dark brown on their Outside, and yellow within. The Leaves are of the round Heart Shape, about 9 Inches long, and as much in Breadth near their Base, having pretty long Foot Stalks. The Stalks rise from 2 to 3 Feet high; they are very thick, and have a few small roundish Leaves on the lower Part, but the upper Part closely garnished with Spikes of white Flowers, standing erect, close to the Stalks. These appear

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the latter End of May, and are succeeded by large triangular Seeds, which ripen in August.

The 3d Sort grows naturally in Ponds, Ditches, and standing Waters, in many Parts of England; this is supposed to be the *Britannica* of the Ancients. It hath large Roots which strike deep into the loose Mud; sending out Leaves above 2 Feet long; and 4 Inches broad in the Middle, drawing to a Point at each End. The Stalks rise 4 Feet in Water, but in dry Land, not more than 2; these are garnished with narrow Leaves among the Spikes of Flowers, to the Top. The Flowers stand on slender Foot Stalks which are reflexed, they are of an herbaceous Colour, appear in June, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in moist Places in many Places of England; this is the *Oxylopatum* of the Shops, which is directed by the College to be used in Medicine; but the Markets are supplied with Roots of the common Docks, which are indifferently gathered by those who collect them in the Fields, where the 8th Sort is much more common than this. The Roots of this are slender and run downright, sending out a few small Fibres; the Stalks rise about 2 Feet high, are garnished with Leaves below, about 4 Inches long, and one and a Half broad in the Middle; they are rounded at their Base, where they are slightly indented, but end in acute Points; they are plain, and slightly crenated on their Edges. From the Joints of the Stalk come out alternately slender long Foot Stalks, which sustain the Spikes of Flowers, which grow in small Whorls round the Stalks, at about an Inch distance; these have scarce any Leaves on the Foot Stalks between the Whorls of Flowers, so may be easily distinguished from the small Water Dock, which has many. This flowers in June, and the Seeds ripen in Autumn.

The 5th Sort is more commonly found growing naturally about London than the 4th; the Leaves of this are much longer than those of the former, and are indented on their Sides, which are waved; the Stalks rise about the same Height as those of the former. The Spikes of Flowers from their Side are shorter, and closer garnished with Flowers on pretty long Foot Stalks; the Covering of the Seed is entire. It flowers and seeds about the same Time with the former.

The 6th Sort is very like the fourth in Appearance, but the Leaves have deep Blood-coloured Veins, and some small Spots of the same on their Surface; the Stalks are red, and rise about the same Height as the 4th, but the Covering of the Seed is entire, whereas that of the 4th is indented, so may be readily distinguished. It grows naturally in many Parts of England.

The 7th Sort grows naturally in several Parts of England; this is a biennial Plant, which perishes soon after the Seeds are ripe; the Stalks rise near 2 Feet high, they are a deep purple Colour, garnished with Spear-shaped Leaves toward the Bottom, 4 Inches long, and almost 1 broad in the Middle, but those on the upper Part of the Stalk are very narrow, and not more than 2 Inches long; the Spikes of Flowers come out from the Sides of the Stalks alternately. The Flowers grow in thick Whorls which sit close to the Stalks; these are of a bright yellow, and the Covers of the Seeds are sharply indented.

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The 8th Sort is the most common Dock by the Sides of Roads and Banks in every Part of *England*; the Leaves of this are broad and rounded at their Points, though some of them end more acutely than others; they are near a Foot long, and 5 Inches broad toward their Base, having many transverse Veins running from the Mid-rib to the Borders. The Stalks rise from 2 to 3 Feet high, branching out on their Sides, having a few Leaves on their lower Part of the same Shape with the other, but smaller. The Flowers grow in Whorls, sitting very close to the Stalks; some Plants have indented Coverings to their Seed, and others have them entire; both these are frequently found intermixed, so that I doubt of their being distinct Species. The Leaves of this Dock were formerly much used for wrapping up of Butter, and from thence the Plant was called Butter Dock.

The 9th Sort grows naturally in many Places near *London*; this is a biennial Plant, which perishes soon after the Seeds are ripe. The Stalks of this rise about a Foot high, and branch out from the Bottom; the Leaves grow near the Root; they are about 2 Inches and a Half long, and hollowed on their Sides, so as to resemble the Sides of a Fiddle; the Stalks are generally bent at their Joints. The Flowers grow in Whorls round the Stalks, to which they sit very close; they are hermaphrodite; the Covers of the Seeds are sharply indented.

The 10th Sort is sometimes found growing naturally in *England*, on Places where the Water has stood in Winter. This seldom rises more than 5 or 6 Inches high, but divides into 2 or 3 Branches; the Leaves are about 3 Inches long, and a Quarter of an Inch broad; they are smooth, and stand on short Foot Stalks. The Flowers grow in Whorls round the Branches, to which they sit very close; they are succeeded by small triangular Seeds, having indented Covers.

The 11th Sort came originally from *Aleppo*; this is a biennial Plant; the Leaves are 9 or 10 Inches long, smooth, and of a light green; they are 3 Inches broad at their Base, where they are indented, and end in acute Points. The Stalks rise from 2 to 3 Feet high, sending out many Branches from their Sides, garnished with large Whorls of herbaceous Flowers, standing on pretty long Foot Stalks; these are succeeded by three cornered Seeds, whose Coverings are deeply indented.

The 12th Sort grows naturally in *Egypt*; this is an annual Plant; the Stalk rises about 10 Inches high, sending out a few horizontal Branches toward the Bottom; the Leaves are about 2 Inches long, and half an Inch broad at the broadest Part. The Flowers grow in Whorls round the Stalks, they are very small, and the Hair-like Beards which adhere to the Covering of the Seed being long, obscure the Flowers, so are scarce visible to the naked Eye.

All these Sorts of Docks rise easily from Seeds, and, if introduced into a Garden, will become troublesome Weeds, if their Seeds are permitted to scatter; therefore few Persons care to propagate any of them, except the 2 first Sorts, which are cultivated for their Use in Medicine. The Seeds of all the Docks should be sown in Autumn soon after they are ripe, for those Seeds sown in Spring, rarely grow the same Year: When the Plants come up, they will require no other Care but to

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thin them where too close, and keep them clean from Weeds. They all delight in a moist rich Soil.

The 13th Sort is commonly known among the Gardeners, by the Title of Sorrel Tree. This came originally from the *Fortunate*, or *Canary Islands*, but has been long an Inhabitant in some *English* Gardens; it rises with a ligneous Stalk 10 or 12 Feet high, covered with a smooth brown Bark, sending out many slender Branches; these are garnished with smooth roundish Heart-shaped Leaves, two Inches long, and an Inch and a Half broad, standing alternately upon pretty long Foot Stalks. The Flowers come out in loose Panicles toward the End of the Branches, they are of an herbaceous Colour, and are sometimes succeeded by triangular Seeds with smooth Covers, but they rarely ripen in *England*. This Plant is easily propagated by Cuttings, which may be planted in any of the Summer Months, in a Bed of loamy Earth, and shaded from the Sun until they have taken pretty good Root; then they should be taken up, and planted in Pots filled with Kitchen Garden Earth, placing them in the Shade till they have taken new Root, after which they may be removed to a sheltered Situation, and placed with other hardy Greenhouse Plants till Autumn, when they must be removed into the Green-house, and treated as other hardy Kind of Plants, which only want Protection from Frost.

The 14th Sort is a low annual Plant, which grows naturally in *Italy* and *Spain*; this is generally found on swampy moist Ground; the Stalks are slender, branching at the Bottom, and rise about 4 Inches high; the lower Part is garnished with small, oval, succulent Lobes; their upper is furnished with small herbaceous Flowers growing in Whorls, and have no Leaves between them; they are succeeded by small Seeds, whose Covers are sharply indented and reflexed. These appear in *June*, and the Seeds ripen in *August*, which, if permitted to scatter, will furnish a Supply of young Plants the following Spring; or if the Seeds are then sown, the Plants will come up the following Spring, and require no other Care but to thin them, and keep them clean from Weeds.

The 15th Sort is an annual Plant; this hath pretty thick succulent Stalks, which rise a Foot high, and divide into many Branches; the Leaves are of the round Heart Shape and undivided, having very long Foot Stalks. The Flowers grow in loose Spikes at the End of the Branches, they are herbaceous, and are succeeded by large Covers to the Seeds, which are inflated, and have broad membranaceous Borders; the Seeds are triangular and ripen in Autumn.

The 16th Sort grows naturally in *Egypt*; this is also an annual Plant, whose Stalks rise a Foot and a Half high, dividing upward into several Branches; the Stalks are garnished with Arrow-pointed Leaves about 3 Inches long, whose Sides are irregularly torn, as if gnawed by Insects; they stand on pretty long Foot Stalks, and have smooth Surfaces; the Flowers are disposed in loose Spikes; some Spikes have only male Flowers, and others have all hermaphrodite Flowers, and some Plants have only male, and others hermaphrodite Flowers. The latter are succeeded by triangular Seeds, inclosed in large inflated Covers of a deep red Colour,

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having membranaceous Borders. The Seeds of this ripen in Autumn.

The Seeds of both these Sorts grow very freely, if sown in a Bed of light Earth in Spring, where the Plants are designed to remain. When they come up they require no other Care, but to keep them clean from Weeds, and thin them where too close.

RUSCUS. *Tourn. Inst. R. H. 79. Tab. 15. Lin. Gen. Pl. 1008.* Knee-holly, or Butchers broom; in French, *Houx-frelon*.

The Characters are,

It hath male and female Flowers in distinct Plants; the male Flowers have erect spreading Empalements composed of 6 oval convex Leaves whose Borders are reflexed; they have no Petals, but an oval Nectarium the Size of the Empalement, which is erect and inflated, opening at the Mouth; they have no Stamina, but each has 3 spreading Summits, sitting on the Top of the Nectarium, which are joined at their Base. The female Flowers have Empalements but no Petals, and Nectaria like the male; they have no Stamina, but have an oblong oval Germen, bid within the Nectarium, supporting a cylindrical Style, crowned by an obtuse Stigma, standing above the Mouth of the Nectarium. The Germen afterward becomes a globular Berry with two or three Cells inclosing two globular Seeds.

The Species are,

1. *Ruscus foliis supra floriferis nudis.* Hort. Cliff. 465. *Ruscus* with Leaves which bear Flowers on their upper Side, and are naked. *Ruscus myrtifolius aculeatus.* Tourn. Inst. 79. Knee-holly or Butchers-broom, with prickly Myrtle Leaves.
2. *Ruscus foliis subtus floriferis nudis.* Hort. Cliff. 465. *Ruscus* with Leaves which bear Flowers beneath, and are naked. *Ruscus latifolius, fructu folio innascente.* Tourn. Inst. 79. Butchers-broom with broad Leaves, upon which the Fruit grows.
3. *Ruscus foliis subtus floriferis sub foliolo.* Hort. Cliff. 465. *Ruscus* with flowers under the Leaves. *Ruscus angustifolius, fructu folio innascente.* Tourn. Inst. 79. Butchers-broom with narrow Leaves, and Fruit sitting upon the Leaves.
4. *Ruscus racemo terminali hermaphroditico.* Hort. Cliff. 469. *Ruscus* with hermaphrodite Flowers in long Bunches terminating the Stalks. *Ruscus angustifolius, fructu summis ramulis innascente.* Tourn. Inst. 79. Butchers-broom with narrow Leaves, and Fruit growing at the Top of the Branches.
5. *Ruscus foliis ternis ovatis acuminatis, supra floriferis nudis.* *Ruscus* with oval acute-pointed Leaves placed by Threes, and Flowers on their upper Side.
6. *Ruscus foliis ovatis acuminatis, supra floriferis nudis, caulibus flexuosis.* *Ruscus* with acute-pointed Leaves bearing Flowers on their upper Side, and flexible Stalks. *Ruscus latifolius major fructu folio innascente.* Michel. Greater broad-leaved *Ruscus* with Fruit sitting upon the Leaf.
7. *Ruscus foliis margine floriferis.* Hort. Cliff. 464. *Ruscus* with Flowers growing on the Borders of the Leaves. *Ruscus latifolius & foliorum sinu florifer & fructifer.* Hort. Elth. 532. Tab. 250. Broad-leaved *Ruscus* with Flowers and Fruit growing on the Edges of the Leaves.

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8. *Ruscus caule fruticoso ramoso, foliis lanceolatis rigidis, floribus pedunculatis terminalibus.* *Ruscus* with a shrubby branching Stalk, Spear-shaped stiff Leaves, and Flowers growing on Foot Stalks terminating the Branches. *Ruscus latifolius frutescens, floribus racemosis rubris.* Houst. Mss. Shrubby broad-leaved *Ruscus* with branching red Flowers.

The 1st Sort is very common in the Woods in England, and is rarely cultivated in Gardens. The Roots are sometimes used in Medicine, and the green Shoots cut, bound into Bundles, and sold to the Butchers, who used it as Besoms to sweep their Blocks, from whence it had the Name of Butchers-broom. It is also called by some Knee Holly.

This hath Roots composed of many thick white Fibres, which strike deep in the Ground, and twine about each other, from which arise several stiff green Stalks, which rise about 3 Feet high, sending out from their Side several short Branches, garnished with stiff, oval, Heart-shaped Leaves, placed alternately on every Part of the Stalk; they are about half an Inch long, and one Third of an Inch broad near their Base, ending with sharp prickly Points. The Flowers are produced on the upper Side of the Leaves just in the Middle; these are male in some, and female in other Plants; they are small, and cut into six Parts, of a purple Colour sitting close to the Mid-rib; they appear in June, and the female Flowers are succeeded by Berries, almost as large as Cherries, of a sweetish Taste, which ripen in Winter, when they are of a beautiful red Colour.

As this Plant grows wild in most Parts of England, it is rarely admitted into Gardens, but, if some of the Roots are planted under tall Trees in large Plantations, they will spread into large Clumps, and, as they retain their Leaves in Winter, at that Season they will have a good Effect. The Seeds of this Plant generally lie a Year in the Ground before they vegetate, and the Plants so raised are long before they arrive to a Size enough to make any Figure, so it is not worth while to propagate them that Way, especially as the Roots may be easily transplanted from the Woods. The Roots and Seeds of this Plant have been used in Medicine; the Roots are aperitive, and esteemed good for removing Obstructions; the Seeds are an Ingredient in the Composition of the *Benedicta laxativa*; the young Shoots of this Plant in the Spring are sometimes gathered and eaten by the Poor like those of *Asparagus*; the Branches of this Plant, with their ripe Fruit upon them, are frequently cut, and put into Basons, mixing them with the Stalks of ripe Seeds of male Piony, and those of the wild Iris or Gladwyn, which together make a pretty appearance in Rooms, at a Season of the Year, when there are few Flowers, and these will continue a long Time in Beauty.

The 2d Sort grows naturally in the mountainous Parts of Italy, but is preserved for the Sake of Variety, in many English Gardens. The Roots of this have large knotty Heads with long thick Fibres like those of the former Sort, from which arise many tough limber Stalks near 2 Feet high; these are garnished by stiff, oblong, oval Leaves ending in Points, which are more than 2 Inches long, and almost 1 broad; they are placed alternately on the Stalks. The Flowers are produced

produced on the under Surface of the Leaves near the Middle sitting close to the Mid-rib; they are small, and of an herbaceous white Colour; the female Flowers are succeeded by small red Berries about the Size of those of Juniper. This flowers in July and the Seeds ripen in Winter.

It stands in most Dispensaries among the Plants used in Medicine, and has been commended for opening Obstructions of the Kidneys, and to provoke Urine.

The 3d Sort grows naturally upon shady Mountains in Italy, Hungary, and other Parts of Europe. The Root of this is composed of many thick Fibres like those of the former, from which arise many tough limber Stalks about 10 Inches high, garnished with Spear-shaped Leaves about 3 Inches long, and one broad in the Middle, drawing to a Point at both Ends; they have several longitudinal Veins, which run from the Foot Stalk to the Point, diverging from the Mid-rib in the Middle, but join again at the Point; the Leaves are for the most Part alternate, but sometimes they are opposite. On the Middle of the upper Surface of these comes forth a small Leaf of the same Shape; and at the same Point from the Bosom of the small Leaves come out the Flowers, of a pale yellow Colour. The female Flowers are sometimes succeeded by Berries, almost as large as those of the 1st Sort, which ripen in Winter, and are red. This is sometimes called *Biflingua*, or double Tongue, from the Leaves growing one out of another. It stands in Dispensaries as a medicinal Plant, but is rarely now used.

The 4th Sort grows naturally in the *Archipelago*, but is frequently planted in the *English* Gardens; it is called *Laurus Alexandrina*, i. e. *Alexandrian* Bay, and is supposed to be the Plant with which the Ancients crowned their Victors and Poets. The Stalks of this being very pliable may be easily wrought into Coronets for this Purpose, and the Leaves of this Plant having a great Resemblance to those which are represented on the ancient Busts, seem to confirm this Opinion.

The Roots of this are like those of the former Species; the Stalks are slender and much more pliable; they rise about 4 Feet high, and send out many Side Branches, garnished with oblong acute-pointed Leaves about 2 Inches long, and one Third of an Inch broad, rounded at their Base but end in acute Points; they are smooth and of a lucid green, placed alternately, and sit close to the Branches. The Flowers are produced in long Bunches at the End of the Branches; these are hermaphrodite, of an herbaceous yellow Colour, and are succeeded by Berries like those of the first Sort, which ripen in Winter.

The 5th Sort grows naturally in *Zant* and some of the other Islands in the *Morrea*. The Roots of this are like those of the former Sorts; the Stalks rise about 2 Feet high; they are slender, pliable, and garnished with oval Leaves placed by Threes round the Stalk; they are about 2 Inches long, and one broad, rounded at both Ends terminating in acute Points, and have several longitudinal diverging Veins running from the Foot Stalk to the Point. The Flowers grow on the under Side of the Leaves fastened to the Mid-rib; they are naked, and have pretty long Foot Stalks; the Segments

or Petals are very narrow; the Fruit I have not seen, so can give no Account of it.

The 6th Sort grows naturally in Italy, where it was discovered by Signior *Micheli* of Florence. The Roots of this are much longer than those of the first Sort; the Stalks rise near 5 Feet high; they are very pliant, and send out several Side Branches their whole Length, garnished with stiff oval Leaves ending in acute Points; they are 1 Inch long, and half an Inch broad. The Flowers are produced on the upper Surface of the Leaves, sitting close to the Mid-rib; they are small, and of an herbaceous white Colour. These are succeeded by Berries smaller than those of the first Sort, and of a pale red, when ripe.

All these Sorts are very hardy, and will thrive in almost any Soil or Situation, so are very proper for planting round the Verges of close Woods, or under large Trees in Wilderness Quarters, for as they are always green they make a good Appearance in Winter, after the deciduous Trees have cast their Leaves; they are easily propagated by parting their Roots. The best Time for this is in Autumn, but, when this is performed, the Roots should not be divided into small Parts, because that will weaken them so much, that they will make but little Figure, until they have had 2 or 3 Years Growth; they may also be propagated by sowing the Seeds, but this is a very tedious Method, so is seldom practised.

The 7th Sort sends out pliant Stalks which rise 7 or 8 Feet high, and have several short Branches proceeding from their Sides, garnished with stiff Leaves about 2 Inches long, and 1 broad toward their Base, where they are rounded to the Foot Stalk, but end in acute Points; they have a great Number of longitudinal Veins running from the Foot Stalk to the Point. The Flowers are produced in Clusters on the Edges of the Leaves; they are white, and are succeeded by Berries of a yellowish red Colour, not so large as those of the 1st Sort.

This Sort is tender, and must therefore be planted in Pots filled with fresh Earth, and in Winter removed into the Green-house; but it should be placed where it may have free Air in mild Weather, for it only requires to be screened from Frost, and in the Summer it must be set abroad with other hardy Green-house Plants. With this Management the Plants will send forth Stems 6 or 8 Feet high, furnished with Leaves from Bottom to Top, and in June will be closely set with Flowers upon their Edges, which make a very beautiful and odd Appearance, and renders it worthy of a Place in every good Collection of Plants. This is also propagated by parting the Roots, as the former, which should not be done very often, because, if the Roots are not permitted to remain some Time to get Strength, they will produce but weak Shoots, and very few Flowers, and in the Strength of their Shoots and Number of Flowers, their greatest Beauty consists. This Sort grows plentifully at *Madeira*, from whence the Seeds may be procured; but this commonly lies in the Ground a Year before the Plants come up, so should be sown in Pots filled with fresh Earth, and placed under a hot Bed Frame in Winter, to screen the Seeds from

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the Frost, and the following Spring the Plants will appear.

The 8th Sort was discovered by Dr. Housoun at Cartbagena in New Spain; this rises with shrubby Stalks 8 or 10 Feet high, which divide into many Branches, garnished with stiff Spear-shaped Leaves 3 Inches long, and 1 broad in the Middle, ending in acute Points; they are sometimes ranged in Whorls round the Stalks, and at others they are opposite. The Flowers are produced in loose Bunches, at the End of the Branches, standing on slender Foot Stalks; they are small, of a red Colour, and shaped like those of the first Sort.

This Plant is tender, so must be kept in a Stove during the Winter, otherwise it will not live in England.

RUTA. Tourn. Inst. R. H. 257. Tab. 133. Lin. Gen. P. 469. Rue.

The Characters are,

The Flower has a short permanent Empalement cut into 5 Parts; it has 4 or 5 oval Petals which spread open, and narrow at their Base, and 8 or 10 Awl-shaped spreading Stamina, the Length of the Petals, crowned by short erect Summits, with a gibbous Germen having a Cross Furrow, marked with 10 Spots, supporting an erect Awl-shaped Style crowned by a single Stigma. The Germen afterward becomes a gibbous Capsule with 5 Lobes and 5 Cells opening in 5 Parts at the Top, and filled with rough angular Seeds.

The Species are,

1. RUTA foliis decompositis, floribus octandris, flaminibus corollâ longioribus. Rue with decomposed Leaves, and Flowers having 8 Stamina longer than the Petals. Ruta bortenensis latifolia. C. B. P. 336. Broad-leaved Garden Rue.

2. RUTA foliis decompositis, foliolis oblongo-ovatis, flaminibus corollâ æquantibus. Rue with decomposed Leaves, the small Leaves oblong and oval, and Stamina equalling the Petals. Ruta bortenensis altera. C. B. P. 336. Another Garden Rue.

3. RUTA foliis inferioribus decompositis, foliolis linearibus, summis quinquefidis trifidisque. Rue with decomposed linear Leaves below, and the upper ones 5 or 3-pointed. Ruta sylvestris minor C. B. P. 336. Smaller wild Rue.

4. RUTA foliis decompositis floribus decandris, marginibus petalorum ciliatis. Rue with decomposed Leaves. Flowers having 10 Stamina, and the Borders of the Petals of the Flower hairy. Ruta Chalepensis latifolia, florum petalis villis scatentibus H. L. Broad-leaved Aleppo Rue with hairy Petals to the Flower.

5. RUTA foliis compositis, floribus decandris, petalis florum ciliatis. Rue with compound Leaves, Flowers having 10 Stamina, and hairy Petals to the Flower. Ruta Chalepensis tenuifolia, florum petalis villis scatentibus. Mor. Hist. 2. 508. Narrow-leaved Aleppo Rue with hairy Petals to the Flower.

6. RUTA foliis simplicibus indivisis. Lin. Sp. Pl. 384. Rue with single undivided Leaves. Ruta sylvestris linifolia Hispanica. Bocc. Mus. 2. p. 82. Wild Spanish Rue with a Flax Leaf.

7. RUTA caule erecto corymboso, foliis compositis floribus decandris, flaminibus corollâ longioribus. Rue with an erect Corymbus Stalk, compound Leaves, and Flowers

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having 10 Stamina longer than the Petals. Ruta sylvestris montana. Clus. Hist. Wild Mountain Rue.

The 1st Sort is the common Rue, which has been long cultivated in the Gardens, and which is directed to be used in Medicine, but of late Years the 2d Sort has so generally prevailed, as almost to supplant the 1st, in the Gardens about London, it being hardier than the first, and not so liable to be killed by severe Frost.

This rises with a shrubby Stalk to the Height of 5 or 6 Feet, sending out Branches on every Side, garnished with decomposed Leaves, whose small Leaves (or Lobes) are Wedge-shaped; they are of a gray Colour, and have a strong Odour. The Flowers are produced at the End of the Branches in Bunches almost in Form of Umbels; they are composed of 4 yellow concave Petals, cut on their Edges, and 8 yellow Stamina longer than the Petals terminated by roundish Summits. The Germen becomes a roundish Capsule, with 4 Lobes punched full of Holes, containing rough black Seeds. It flowers in June, and the Seeds ripen in Autumn.

The 2d Sort hath a shrubby Stalk which rises 3 or 4 Feet high, sending out many Branches garnished with decomposed Leaves narrower than those of the former Sort; they are of a bluish gray Colour, and have a strong Odour. The Flowers grow in longer and looser Bunches than the former; they have 4 short, concave, yellow Petals, and 8 short Stamina of equal Length with the Petals. The Seed Vessel is like that of the former, but smaller. This Sort is more commonly to be found in Gardens than the first.

The 3d Sort grows naturally in Spain. The lower Leaves are compounded of several Parts, which are joined to the Mid-rib in the same Manner as the branching winged Leaves which are garnished with small linear Leaves standing without Order. The Stalks rise from 2 to 3 Feet high, branching out from the Bottom; these are garnished with Leaves divided into 5 Parts, and those at the Top into 3 as small and narrow as those at the Bottom; they are of a gray Colour, but not so flinking as those of the other. The Flowers grow at the End of the Branches in loose Spikes which are generally reflexed; the Petals of the Flower are yellow, and appear in June; these are succeeded by small Seed Vessels filled with angular black Seeds. It flowers in June, and the Seeds ripen in Autumn.

The Seeds of the 4th Sort came from Aleppo, and it has been brought from the Cape of Good Hope; this hath strong shrubby Stalks about 3 Feet high, divided into many Branches, garnished with decomposed Leaves, larger than those of the common Sort, and have a stronger Odour. The Flowers are disposed almost in Form of an Umbel at the End of the Branches; they have 5 concave yellow Petals, whose Borders are set with fine Hairs, and 10 Stamina of equal Length with the Petals. This Sort flowers in June, and the Seeds ripen in Autumn. The Seed Vessels of this are much larger than those of the common Sort.

The 5th Sort grows naturally at Aleppo; this hath shrubby Stalks which are smaller, and do not rise so high as those of the former Sort. The Leaves are much narrower and grayer than those, but have the same strong Odour; the Flowers are smaller and have

5 Petals

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5 Petals pretty closely set with small Hairs they have 10 thick Stamina, 5 of which are alternately longer than the Petals; the Seed Vessels are like those of the first Sort.

The 6th Sort grows naturally in *Spain*; this rises with several single Stalks from the Root near a Foot and a Half high, garnished with single Leaves about three-Quarters of an Inch long, and one Eighth of an Inch broad; they are of a yellowish green Colour, and placed alternately on the Stalks, to which they sit pretty close; at the Base of these come out 1 or 2 very small Leaves of the same Shape and Colour. The Flowers grow in small Clusters at the End of the Stalks; they have each 5 oblong yellow Petals, and 10 Stamina of equal Length with them, terminated by Awl-shaped Summits. This flowers in *June*, and the Seeds ripen in Autumn.

The 7th Sort rises with an erect Stalk about 2 Feet high, garnished with compound Leaves, whose smaller Leaves are narrow and obtuse, of a grayish Colour, but have not so strong an Odour as the former. The upper Part of the Stalk divides in Form of a Corymbus sustaining upon naked Foot Stalks small Bunches of yellow Flowers, which have 5 concave Petals and 10 Stamina much longer than the Petals terminated by roundish Summits.

All these Plants may be propagated either by sowing the Seeds, or planting Ships or Cuttings, both of which must be done in the Spring. The Manner of propagating them from Cuttings being the same as for Lavendar, Stoechas, and other hardy aromatick Plants need not be here repeated; and, if they are propagated by Seeds, there needs no farther Care but to dig a Bed of fresh Earth in the Spring, making it level; then sow the Seed thereon, and rake the Ground smooth; after which you must observe to keep the Bed clear from Weeds until the Plants come up about 2 Inches high, when they should be transplanted out into fresh Beds, where they may remain for Use. All these Plants must have a dry Soil, otherwise they are very subject to be destroyed in Winter. The two *Aleppo* Rues, and the wild Rue, are somewhat tenderer than the common Sort, but these will endure our ordinary Winters very well in the open Air, especially if planted on a dry Soil.

The 6th and 7th Sorts are tenderer than either of the other, and of shorter Duration. The Seeds of the 7th Sort were sent me from *Gibraltar Hill*, where the Plant grows naturally; this doth not ripen its Seeds here, unless the Summers are warm, and, in hard Winters the Plants are generally killed, unless removed into Shelter.

The 6th Sort will live through the Winter in the open Air, provided it is planted in a poor dry Soil, and the second Year it will perfect Seeds; but, as it is of short Duration young Plants should be annually raised to succeed the others.

All the Sorts of Rue will live much longer, and are less liable to be injured by Frost in Winter, when they grow in a poor dry rubbishy Soil, than in good Ground, for in rich moist Land the Plants grow very vigorously in Summer, and are so replete with Moisture, that a small Frost will kill their tender Shoots, whereas, in poor dry Ground, their Growth will not be great, but their Shoots will be hard and compact, so more able to resist the Cold;

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The 1st Sort was formerly used to plant for Edgings on the Sides of the Borders; it was then called *Herb of Grace*, but was by no means proper for this Use, for the Plants shoot so vigorously, that there is no keeping them within the Bounds of an Edging; besides, when they are kept closely sheered, they appear to be very ragged and stumpy, and their Roots spread so far, as to exhaust the Goodness of the Soil, so that the other Plants would be deprived of their Nourishment, which Reasons have caused them to be wholly neglected for this Purpose, so that at present they are chiefly cultivated for medicinal Use, or to furnish the Balconies for the Citizens in the Spring, especially that with a variegated Leaf.

RUTA CANINA. See Scrophularia.

RUTA MURARIA, Wall-rue, or white Maiden-hair.

This Plant is found growing out of the Joints of old Walls in divers Parts of *England*, where it is gathered for medicinal Use, but, as it cannot be cultivated in Gardens, so as to grow to Advantage, I shall not say any Thing more of it in this Place.

RUYSCHIANA. Boerb. Ind. alt. 1. p. 172. *Dracocephalum*. Lin. Gen. Pl. 648.

The Characters are,

The Flower hath a permanent Empalement of 1 Leaf, which is tubulous, and cut into 5 Segments at the Top, the upper one being broader and blunter than the other; it is of the Lip Kind, having one Petal which has a Tube longer than the Empalement. The Chaps are large and swelling; the upper Lip is erect and arched; it is gently indented at the Top; the lower Lip is trifid; the two Side Segments are narrow, and stand erect; the middle is broad, reflexed, and indented at the Point. It hath 4 Stamina 2 of which are long, and situated under the upper Lip; the other 2 are shorter, and situated just below them; they are terminated by oblong Summits fastened in the Middle; it has 4 Germina situated at the Bottom of the Empalement supporting a slender Style, the Length of the Stamina, crowned by a bifid reflexed Stigma. The Germina afterward become 4 oblong Seeds which ripen in the Empalement.

The Species are,

1. RUYSCHIANA floribus spicatis, foliis bracteisque linearibus glabris indivisis. Ruyschiana with spiked Flowers, linear Leaves, and Bractæe which are smooth and undivided. Ruyschiana flore ceruleo magno. Boerb. Ind. alt. 1. p. 172. Ruyschiana with a large blue Flower.

2. RUYSCHIANA floribus spicatis, foliis linearibus trifidis hirsutis. Ruyschiana with spiked Flowers and hairy, linear, three-pointed Leaves. Ruyschiana hirsuta, foliis laciniatis. Amman. Ruth, 50. Hairy Ruyschiana with jagged Leaves.

3. RUYSCHIANA floribus axillaribus, foliis lanceolatis dentatis glabris. Ruyschiana with Flowers growing at the Wings of the Stalks, and smooth, indented, Spear-shaped Leaves. Dracocephalon foliis ex lanceolato linearibus rarius dentatis spinulosis, floribus gemellis. Gmel. Dragons-head with linear Spear-shaped Leaves which are rarely indented, somewhat prickly, and Flowers growing by Pairs.

The 1st Sort grows naturally in *Austria* and *Hungary*; this hath a perennial Root, and an annual Stalk, which is four-cornered, and rises about 2 Feet high garnished

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nished with two smooth linear Leaves at each Joint, which are about 1 Inch long, and one Eighth of an Inch Broad, with a deep Furrow along the Middle, and at each Joint, at the other Sides of the Stalk, come out 2 or 3 very narrow small Leaves of the same Shape. The Flowers are produced in whorled Spikes at the Top of the Stalks, having small narrow Leaves under each Whorl. The Flowers have tubulous Empalements of one Leaf cut into 5 Segments at the Top, 4 of which are narrow, and end in acute Points; the other, which is on the upper Side of the Flower, is broader, and rounded at the Point. The Tube of the Flower is longer than the Empalement, and is swelling and large at the Chaps; the upper Lip is broad, erect, and arched over the Tube; the lower Lip is shorter, and has 2 short Side Segments which are erect, but the middle Segment is broad, rounded, and indented at the Point, and is reflexed back to the Tube. It has 4 Stamina which lie close under the upper Lip, and are arched in the same Manner; 2 of these are as long as the Style, which stands in the same Position; the other 2 are shorter, and situated just below the other; they are terminated by oblong Summits, fastened in the Middle to the Stamina. The Style is crowned by a bifid reflexed narrow Stigma; the Flowers appear in *June*, and are of a fine blue Colour; these are each succeeded by 4 oblong Seeds which ripen in the Empalement.

The 2d Sort grows naturally in *Siberia*; this hath a perennial Root. The Stalks are four-cornered, hairy, and rise a Foot and a Half high, sending out several Side Branches, garnished with hairy linear Leaves, cut into 3 Parts; the Flowers grow in short whorled Spikes at the End of the Stalk, having some very narrow Leaves under each Whorl; the Tube of the Flower is longer, and more equal in Size than that of the former, and the middle Segment of the lower Lip is not so much reflexed. In other Respects, the Flowers are the same as those of the former.

The 3d Sort grows naturally in *Tartary*; this hath a perennial Root, and annual Stalks which do not grow erect like the 1st, but spread nearer to an horizontal Position; they divide into several Branches which have 2 large Leaves opposite at each Joint, and 4 smaller, 2 on each Side between the larger; they are smooth, have sharp Indentures on their Edges, and stand erect. The Flowers come out from the Side of the Stalks at the Base of the Leaves, 2 or 3 standing together on each Side the Stalk; their Empalements are purple, and cut into 5 acute Segments at the Top, the upper Lip having 3 broad, and the lower 2 narrower. The upper Lip of the Flower is broad, indented at the Point, and erect; the lower is trifid, but the middle Segment is not so much reflexed as that of the first Sort, and the

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SABINA. See Juniperus.
SACCHARUM. Lin. Gen. Pl. 68. *Arundo*. C. B. P. 18. The Sugar Cane.

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Flowers are of a paler blue than those. It flowers in *June*, and the Seeds ripen in Autumn.

These Plants are propagated by Seed, which should be sown, the latter End of *March*, in a Bed of fresh light Earth in an open Exposure, and in about 5 or 6 Weeks after the Plants will appear, when they should be carefully cleared from Weeds, and, if the Season should prove dry, they must be refreshed now and then with Water, which will greatly promote their Growth. When the Plants are about 2 Inches high, they should be carefully transplanted into a Bed or Border of fresh light undunged Earth, observing to shade them from the Sun, until they have taken Root, as also to refresh them frequently with Water, until they are well established in this Bed; after which Time they will require no farther Care, but to keep them constantly clear from Weeds till *Michaelmas*, when they are to be removed into the Places where they are designed to remain for good.

When they are first transplanted from the Seed Bed into the Nursery Bed, they should be planted about 6 Inches asunder every Way, which will be sufficient Room for them the first Season; and this will admit of the Hoe to come between the Plants to destroy the Weeds, which is by much a better Method than pulling out the Weeds by Hand, and is much sooner performed. For as the Hoe stirs the Ground between the Plants, it not only cuts down the Weeds which were up and visible, but also destroys all those whose Seeds were sprouted, and would have soon after appeared; so that one Hoeing, if well performed, and in dry Weather, will more effectually destroy the Weeds, than two Hand Weedings would do, were they performed ever so carefully; besides, the stirring the Ground is of great Service to the Plants.

At *Michaelmas*, when the Plants are transplanted for good, they should be carefully taken up with Balls of Earth to their Roots; and they must be planted in the Middle of the Borders in fresh light Earth, intermixing them with other hardy Plants of the same Growth, where they will make a pretty Appearance when they are in flower and will continue 3 or 4 Years; and in some poor stony Soils I have known the Roots live 6 or 7 Years, but these did not produce such large Spikes of Flowers, as those which were younger and more vigorous Plants.

And as these Plants do not continue many Years, it will be proper to raise a Supply of young Plants to succeed them, for the old Plants will produce Seeds plentifully, which are ripe the latter End of *August* or the Beginning of *September*, when they should be gathered in dry Weather, and kept in a warm dry Room till the Time for sowing them.

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The Characters are,
It hath no Empalement, but a Wool longer than the Flower incloses it. The Flower is bivalve; the Valves are oblong, acute-pointed, concave, and chaffy. It has 3 Hair-like

like Stamina the Length of the Valves, terminated by oblong Summits, and an Awl-shaped Germen supporting 2 rough Styles crowned by single Stigmas. The Germen afterward becomes an oblong acute-pointed Seed, invested by the Valves.

We have but one Species of this Genus at present in England, viz.

SACCHARUM floribus paniculatis. Hort. Cliff. 26. Sugar Cane with Flowers growing in Panicles. Arundo saccharifera. C. B. P. 18. The Sugar Cane.

This Plant grows naturally in both Indies, and is there cultivated also for its Juice, which, when boiled, affords that sweet Salt which is called Sugar.

The Canes were formerly cultivated in the South of France for the same Purpose, but it was in small Quantities only, for in sharp Winters they were killed, unless they were covered, so that they had only the Summer for their Growth, which was too short Time for their getting sufficient Strength to produce Sugar enough to answer the Expence, so the planting of these Canes there, has been long discontinued; they were also planted in several Parts of Spain, before they were introduced to France, and are at present cultivated in Plenty in Andalusia, from whence great Quantities of Sugar are annually sent to Madrid, but there are few now planted in the other Parts of Spain.

The Root of this Plant is jointed, like those of the other Sorts of Cane or Reeds, from which arise 4, 5, or more Shoots in Number, proportionable to the Age or Strength of the Root. These rise 8 or 10 Feet high, according to the Goodness of the Ground in which they grow; for in some moist rich Soils there have been Canes measured, which were near 20 Feet long; but these were not near so good as those of middling Growth, as they abounded with Juice, which had but a small Quantity of the essential Salt in it, so that the Expence of Fuel and Trouble of boiling, was more than the Sugar would defray. The Canes are jointed, and these Joints are more or less distant from each other, in Proportion to the Soil. The Leaves are placed at each Joint, and the Base or lower Part of the Leaf embraces the Stalk or Cane to the next Joint above its Insertion, before it expands; these are 3 or 4 Feet long from the Joint where they unfold to their Point, according to the Vigour of the Plant; they have a deep whitish Furrow, or hollowed Mid-rib, which is broad, and prominent on the under Side; the Edges of the Leaves are thin, and armed with small sharp Teeth, which are scarce to be discerned by the naked Eye, but will cut the Skin of a tender Hand, if it be drawn along it. The Flowers are produced in Panicles at the Top of the Stalks, these are from 2 to 3 Feet long, and composed of many Spikes, 9 or 10 Inches long, and are again sub-divided into smaller Spikes; these have long Down which inclose the Flowers, so as to hide them from Sight; afterward the Germen becomes an oblong pointed Seed, which ripens in the Valves of the Flower.

This Plant is preserved by Way of Curiosity in several Gardens in England, but being too tender to thrive here unless preserved in a warm Stove, it cannot be brought to any great Perfection. I have seen some of the Plants growing, which were 7 or 8 Feet high, and at the Bottom as large as a common Walking

Cane, but they have not produced their Panicles of Flowers here.

It is here propagated by Slips taken from the Sides of the older Plants; those which grow near the Root and have Fibres to them, will most certainly grow; so that when the Shoots are produced at some Distance from the Ground, the Earth should be raised about them, that they may put out Fibres before they are separated from the Mother Plant. These Slips should be planted in Pots, filled with rich Kitchen Garden Earth, and plunged into a moderate hot Bed of Tanners Bark, being careful to shade them from the Sun until they have taken new Root, after which they must be treated as other tender Plants from the same Countries. They must be constantly kept plunged in the Tan Bed in the Stove, and as their Roots increase in Size, so the Plants should from Time to Time, be shifted into larger Pots; but this must be done with Caution, for if they are over-potted, they will not thrive: They will require to have Water frequently in warm Weather, but it must not be given them in too great Plenty, especially in cold Weather. As the Leaves of the Plants decay, they should be cleared from about the Stalks, for if they are left to dry upon them, it will greatly retard their Growth. The Stove in which this Plant is placed, should be kept in Winter to the same Temperature of Heat as for the Pine Apple, and in hot Weather there should be Plenty of free Air admitted to the Plants, otherwise they will not thrive.

I shall here subjoin some Account of the Method of propagating and cultivating the Sugar Cane in America, with some Observations and Experiments which have been made by a few curious Persons in the British Islands, and shall propose some farther Trials to be there made, in the Culture and Management of this useful Plant, which are founded upon the Experience I have had in the Culture of some Plants which are similar in their Growth with the Sugar Cane.

The Land most proper for the Growth of Sugar Canes, is such as hath a sufficient Depth of Soil, and is not too moist and strong, but rather light and easy to work; for although strong moist Ground will produce much taller and bigger Canes than the other, yet the Quantity of Sugar will be much less, not near so good, and will require a greater Quantity of Fuel, and a longer Time to boil, before the Sugar can be made; which is also the Case on all fresh Land, where there has not been any Canes growing before; therefore many of the most expert Planters burn their Land when it is first cleared for planting Canes to Abate its Fertility; but if when Land is first cleared of the Wood, and the Roots of bad Weeds, it is sown with Indigo, which such fresh Ground will produce much better than the old, or such as has been long cultivated, there may be two or three Crops of this taken, which will prepare the Land for the Sugar Canes, without being at the Trouble of burning it; but the growing of Indigo has been so little practised in the British Islands of America for many Years past, as to be esteemed unworthy the Notice of a Sugar Planter; whereas if they would sometimes change their Crops to other Species, they would soon find an Advantage in the Growth of their Canes; but the usual Practice is to continue the Canes always upon

upon the same Land as long as it will produce them, without changing the Species, or allowing the Ground a Fallow to rest and recover itself. By this Method there are some Plantations so much exhausted, that the Crop of Sugar will Scarce defray the Expence of Culture.

Another Thing should always be observed in planting fresh Land with Canes, which is to allow them more Room than is generally done; for as the Ground is strong, there will a greater Number of Shoots come out from each Plant, and not having Room to spread at Bottom, they will draw each other up to a great Height, and be full of watery Juice, the Sun and external Air being excluded from the Canes by the Multiplicity of Leaves, which is absolutely necessary to ripen and prepare the Salts during the Growth of the Canes.

If the Ground is proper for the Sugar Canes, and they are planted at a good Distance from each other, and the Land carefully managed, the same Plantation may be continued above 20 Years without replanting, and produce good Crops the whole Time; whereas in the common Method, they are generally replanted in 6 or 7 Years, and in some of the poor Land they are continued but two or three.

The Canes are in those warm Countries propagated by Cuttings or Joints, of proper Lengths; these are from 15 to 20 Inches long, in Proportion to the Nearness of their Joints or Eyes. These Cuttings are generally taken from the Tops of the Canes, just below the Leaves, but if they were chosen from the lower Part, where they are less succulent and better ripened, they would not produce so luxuriant Canes, but their Juice would be less crude, and afford a greater Quantity of Salts, by less boiling than those commonly planted: This is well known to the Judicious to hold true, in most Kinds of Vegetables; and it is by thus carefully propagating all Kinds of esculent Plants, either in the Choice of the best Seeds or Cuttings, that most of the Kinds have been so greatly improved of late Years.

The Distance which the Canes are usually allowed in planting, is from 3 to 4 Feet, Row from Row, and the Hills are about 2 Feet asunder in the Rows; in each of these Hills they plant from 4 to 7 or 8 Cuttings, which is a very great Fault, and is the Cause of most of the Blights so much complained of lately; for if all these grow, which is generally the Case, they rob each other of their Nourishment; and if a dry Season happens before they have acquired Strength, they are very soon stunted in their Growth, and then attacked by Insects, which spread and multiply so greatly, as to cover a whole Plantation in a little Time; when this happens, the Canes are seldom good after, so that it will be the better Way to root them entirely up, when they are so greatly injured, for they very rarely recover this perfectly; for although the Insects are not the Cause of the Disease, yet they confirm it, and cause it to spread.

Therefore, if instead of planting so many, there was but one good Cutting planted in each Hill, or to prevent Miscarriage, 2 at most; and if both succeeded, the weakest was drawn out soon after they had taken, it will be found of great Service to prevent these Blights; and although the Number of Canes will not be near so great from the same Space of Ground, yet the Quantity

of Sugar will be full as much, and will require little more than a 4th Part of Fuel to boil it.

I have been assured by two of the most sensible and judicious Planters of Sugar in America, that they have made some Experiments of the Horse Hoeing Culture for their Canes, which answered much beyond their Expectations; one of those Gentlemen told me, he planted one Acre in the Middle of a large Piece of Canes, in Rows at 5 Feet asunder, and the Hills were 2 Feet and a Half distant, and but one Cutting to each Hill. The Ground between the Rows was from Time to Time stirred with the Horse Plough, to destroy the Weeds and earth the Plants; with this Culture the Canes were double the Size of those in the same Piece, which were cultivated in the usual Way; and when the Canes were cut, those which had been thus planted and managed, were ground and boiled separately; the Produce of Sugar was full as great as the best Acre in the same Piece, and the Expence of boiling was little more than a sixth Part of the other, and he sold the Sugar for six Shillings per hundred Weight more than he could get for the other.

The Time for planting the Canes is always in the rainy Seasons, and the sooner they are planted after the Rains have begun to fall, the more Time they will have to get Strength before the dry Weather sets in; for when they have put out good Roots, and are well established in the Ground, they will not be so liable to suffer by the Drought, as those which have but newly taken Root.

The Season being come for planting, the Ground should be marked out by a Line, that the Rows of Canes may be strait, and at equal Distances; but first it will be proper to divide the Piece into Lands of 60 or 70 Feet broad, leaving Intervals between each of about 20 Feet; these will be found of great Use when the Canes are cut, for Roads in which the Carriages may pass to carry off the Canes to the Mill; for where there is not such Provision made, the Carriages are obliged to pass over the Heads of the Canes, to their no small Prejudice: Besides, by these Intervals, the Sun and Air will have a freer Passage between the Canes, whereby they will be better ripened, and their Juice fuller of Salts; so when the Canes are ground, they will not require so much Fuel to boil their Juice. The Middle of these Intervals may be planted with Yams, Potatoes, or other esculent Plants, which may be taken off before the Canes are cut, that the Passage may be clear for the Carriages; but a Path should be left on the Sides of each Land, for the more convenience of the Overseer of the Plantation, to view and observe how the Labour is performed.

The common Method now practised in planting the Canes is, to make a Trench with a Hoe, which is performed by Hand; into this one Negro drops the Number of Cuttings intended for planting, at the Distance the Hills are designed; these are by other Negroes placed in their proper Position, then the Earth is drawn about the Hills with a Hoe; all this is performed by Hand; but if the right Use of Ploughs was well known, the Work might be much better performed, and for less than half the Expence; therefore instead of making a Trench with a Hoe, a deep Furrow is made with a Plough

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Plough, and the Cuttings properly laid therein, the Ground will be deeper stirred, and there will be more Depth for placing the Canes.

If the Ground is to be afterward kept clean with the Horse Hoe, the Rows of Canes should be planted 5 Feet asunder, that there may be Room for the Horse and Plough to pass between them, and the Distance of the Hills from each other should be 2 Feet and a Half, and but one Cane in each Hill. After the Canes are planted and have made some Shoots, the sooner the Horse Plough is used the better will the Canes thrive, and the Ground will be easier kept clean from Weeds; for if these are torn up when they are young, they will presently die; whereas when they are suffered to grow large before they are disturbed, they are with great Difficulty destroyed.

As the Growth of the Canes is promoted according to the Cleanness of the Ground, so there cannot be too much Care taken to keep the Canes perfectly clear of Weeds; and the Beginning this Work soon will render it less troublesome, and Expensive than when neglected for some Time. When this is performed with a Plough, the Earth in the Interval should be thrown up to the Rows of Canes, first on one Side of the Row, being careful not to disturb the Roots of the Canes, as also not to bury their new Shoots; and in the second Operation, the Earth should be turned over to the other side of the Rows, with the same Care as before. By this turning and stirring the Land, it will be rendered looser, and the earthing the Plants will greatly strengthen them; so that from each Hill there will be as many Shoots produced, as can be well nourished, and the Sun and Air will have free Ingress among the Rows, which will be of the greatest Service to the Canes.

When the Canes are from 7 to 10 Feet high, and of a proportionable Size, the Skin smooth, dry, and brittle, if they are heavy, their Pith gray, or inclinable to brown, the Juice sweet and glutinous, they are esteemed in Perfection.

The Time for cutting the Canes, is usually after they have grown 6 Months; but there should not be a fixed Period for this, for in some Seasons and in different Soils, there will be more than a Month's Difference in their Maturity; and those who have made the Experiments of cutting their Canes before they were ripe, and letting others stand till after they were ripe, have found the Sugar made from the latter, was much finer than that of the former, though the Quantity was not quite so great; however, it will always be best to let them stand till they are in Perfection before they are cut, but not longer.

They have also found those Canes which are cut toward the End of the dry Seasons, before the Rains begin to fall, have produced better Sugar than those cut in the rainy Seasons, when they are more replete with watery Juice; and there has been much less Expence of Fuel to boil it, which is a material Article in large Plantations; therefore the better the Canes are nourished in their Growth, and the more Air and Sun is admitted to pass between their Rows, the less Expence it will be to boil and prepare the Sugar.

In boiling Sugar, they use a Mixture of Wood Ashes and Lime, which is called *Temper*, without which the

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Sugar will not granulate. The Quantity of this Mixture, is proportioned to the Quality of the Ground on which the Canes grew.

SAFFRON. See Crocus.

SAGE. See Salvia.

SAGITTARIA. Lin. Gen. Pl. 946. Sagitta. Dillen. Gen. 4. Ranunculus. Tourn. Inst. R. H. 287. Arrow-head.

The Characters are,

It hath male and female Flowers on the same Plant; the male Flowers have a permanent Empalement of 3 oval concave Leaves; they have 3 roundish Petals which spread open, and are larger than the Empalement, and many Awl-shaped Stamina collected into a Head, terminated by erect Summits. The female Flowers are situated below the male, these have a three-leaved Empalement, and 3 Petals as the male, but no Stamina; they have many compressed Germina collected in a Head, sitting upon very short Styles, and have permanent acute Stigmas. The Germina become oblong compressed Seeds having longitudinal Borders, and are collected in globular Heads.

The Species are,

SAGITTARIA foliis omnibus sagittatis acutis petiolis longissimis. Arrow-head with all the Leaves Arrow-pointed, and long Foot Stalks. *Sagitta aquatica major*. C. B. P. The greater Arrow-head.

2. SAGITTARIA foliis sagittatis spatulisque, petiolis longioribus. Arrow-head with Arrow-pointed and Spatule-shaped Leaves, having longer Foot Stalks. *Sagitta aquatica foliis variis*. Læf. Pruff. 234. Water Arrow-head with variable Leaves.

The 1st Sort grows naturally in standing Waters in England; the Root is composed of many strong Fibres, which strike deep into the Mud; the Foot Stalks of the Leaves are in Length proportionable to the Depth of the Water in which they grow, so are sometimes almost a Yard long; they are round, thick, fungous; the Leaves which float on the Water are shaped like the Point of an Arrow, the two Ears at their Base spreading wide asunder, and are very sharp pointed. The Flowers are produced upon long Stalks which rise above the Leaves, and stand in Whorls round them at the Joints; they have each three broad white Petals which spread open, and in the Middle is a Cluster of Stamina with purple Summits. It flowers in July; the Flowers are succeeded by rough Heads, containing many small Seeds.

The 2d Sort grows plentifully in standing Waters near Paris, but has not been found wild in England. This never grows so large as the former; the Leaves vary greatly, some of them are oblong, round pointed, and shaped like a Spatula; others are Arrow-pointed, but these have their Points less acute than those of the former, and the Flowers are smaller, in which it differs from the former; and as all the Plants where this grows retain their Difference, so it may be supposed a different Species.

There is also a 3d Sort mentioned by Dr. Plukenet, under the Title of *Sagitta aquatica omnium minima*, or the least Arrow-head. This grows plentifully on the Borders of the Thames about Lambeth, and also at Chelsea; the Foot Stalks of the Leaves are very short, the Leaves much less, and the Stalks which support the Flowers very short; but these Differences may be occasioned

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by the Situation of their Growth, for it is always found growing in the Mud, which the Water ebbs from every Tide, so is only covered in high Water, which may stint the Growth of the Plants, and give them this Appearance.

SALICARIA. See Lythrum.

SALICORNIA. Tourn. Cor. App. 51. Tab. 485. Lin. Gen. Pl. 10. Jointed Glasswort, or Saltwort.

The Characters are,

The Flower hath a rugged, swelling, four-cornered Empalement, which is permanent. It has no Petal, and but one Stamen the Length of the Empalement, crowned by an oblong Twin Summit, and an oblong oval Germen supporting a single Style, crowned by a bifid Stigma. The Germen becomes a single Seed, inclosed in the swelling Empalement.

The Species are,

1. **SALICORNIA articulata apice crassioribus obtusis.** Lin. Mat. Med. 8. Jointed Glasswort with thick obtuse Points. *Kali geniculatum.* Ger. Emac. 535. Common jointed Glasswort.

2. **SALICORNIA articulata apice acutioribus, caule fruticoso ramoso.** Glasswort with acute Points to the Joints, and a shrubby branching Stalk. *Kali geniculatum perenne fruticosus procumbens.* Raii Syn. Ed. 2. p. 67. Trailing, shrubby, perennial, jointed Glasswort.

The 1st Sort grows plentifully in most of the Salt Marshes which are overflowed by the Tides, in many Parts of England. This is an annual Plant, with thick succulent jointed Stalks, which trail on the Ground, and divide into several Branches. The Flowers are produced at the Ends of the Joints toward the Extremity of the Branches, which are small, and scarce discernable by the naked Eye. It flowers the latter End of July, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in Sheepy Island; this hath a shrubby branching Stalk, about 6 Inches long; the Points of the Articulations are acute, the Stalks branch from the Bottom, and form a Kind of Pyramid; they are perennial, and produce their Flowers as the former.

The Inhabitants near the Sea Coast, where these Plants grow, cut them up toward the latter End of Summer, when they are fully grown; and after having dried them in the Sun, burn them to Ashes, which they use in making Glass and Soap. These Herbs are, by the Country People, called Kelp, and are promiscuously gathered for Use.

From the Ashes of these Plants is extracted the Salt, called *Sal Kali*, or *Alkali*, which is much used by the Chemists.

The Manner of gathering and burning these Herbs is mentioned under the Article of *Salsola*, so I shall not repeat it in this Place.

In some Parts of England these Herbs are gathered and pickled for Samphire, though that is very different from either of these.

SALIX. Tourn. Inst. R. H. 590. Tab. 364. Lin. Gen. Plant. 976. The Sallow, or Willow Tree; in French, *Saule*.

The Characters are,

It hath male and female Flowers on separate Plants; the male Flowers are disposed in one common, oblong, imbricated Katkin. The Scales have each one oblong spreading Flow-

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er, which has no Petal, but a cylindrical nectarious Gland in the Center. It has 2 slender erect Stamina, terminated by Twin Summits having 4 Cells. The female Flowers are disposed in Katkins as the male; these have neither Petals or Stamina, but an oval narrowed Germen, scarce distinguishable from the Style, crowned by 2 bifid erect Stigmas. The Germen afterward becomes an oval Awl-shaped Capsule with one-Cell, opening with two Valves, containing many small oval Seeds, crowned with hairy Down.

There are several Species of this Genus, which grow naturally in the northern Parts of Europe, of no Use, being low creeping Shrubs, many of them seldom rising a Foot high, so are never cultivated, therefore I shall pass them over, and only enumerate those planted for Use.

The Species are,

1. **SALIX foliis lanceolatis acuminatis serratis utrinque pubescentibus, serraturis infimis glandulosis.** Hort. Cliff. 473. Willow with Spear-shaped, acute-pointed, sawed Leaves, downy on both Sides, and Glands below the Saws. *Salix vulgaris alba, arborescens.* C. B. P. 453. Common white Tree Willow.

2. **SALIX foliis serratis glabris, floribus triandris.** Lin. Sp. Plant. 1015. Willow with smooth sawed Leaves, and Flowers having 3 Stamina. *Salix folio auriculato splendente flexilis.* Raii Hist. 1420. Willow with lucid eared Leaves and flexible Branches.

3. **SALIX foliis serratis glabris, flosculis pentandris.** Hort. Cliff. 454. Willow with smooth sawed Leaves and Flowers having 5 Stamina. *Salix folio laureo seu lato glabro odorato.* Raii Hist. 1420. Willow with a Bay Leaf, or broad-leaved smooth sweet Willow.

4. **SALIX foliis serratis ovatis acutis glabris, serraturis cartilagineis, petiolis calloso punctatis.** Hort. Up. 295. Willow with smooth, oval, acute, sawed Leaves, having cartilaginous Indentures, and Foot Stalks with callous Punctures. *Salix sativa lutea, folio crenato.* C. B. P. 473. Yellow cultivated Willow, with a crenated Leaf.

5. **SALIX foliis serratis glabris lanceolatis petiolatis, stipulis trapeziformibus.** Flor. Leyd. Prod. 83. Willow with smooth, Spear-shaped, sawed Leaves having Foot Stalks, and Trapezium-shaped Stipulæ. *Salix folio amygdalino, utrinque virente aurito.* C. B. P. 43. Almond-leaved Willow with Leaves which are eared, and green on both Sides.

6. **SALIX foliis serratis glabris ovato-lanceolatis, petiolis dentato-glandulosis.** Flor. Lopp. 349. Willow with oval, Spear-shaped, smooth, sawed Leaves, and indented Glandules to the Foot Stalk. *Salix folio longo latoque splendente fragilis.* Raii Syn. 3. p. 448. The Crack Willow.

7. **SALIX foliis serratis glabris lanceolatis, inferioribus oppositis.** H. Scan. 252. Willow with smooth, Spear-shaped, sawed Leaves, the lower of which grow opposite. *Salix folio longo subluteo non auriculato, viminibus rubris.* Raii Syn. The long-leaved red Willow.

8. **SALIX foliis subintegerrimis lanceolato-linearibus longissimis acutis subtus sericeis, ramis virgatis.** Flor. Succ. 813. Willow with the longest, linear, Spear-shaped, acute Leaves, almost entire, and silky on their under Side, and Rod-like Branches. *Salix foliis angustis & longissimis crispis, subtus albicantibus.* J. B. I. p. 212. Willow with the longest, narrow, curled Leaves, white on their under Side.

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9. *SALIX foliis serratis glabris lanceolatis omnibus alternis*. Willow with smooth, Spear-shaped, sawed Leaves, all growing alternate. *Salix folio amygdalino utrinque aurito, Corticem abiciens*. Raii Syn. 3. p. 448. Almond-leaved Willow which is eared on both Sides, and casts its Bark.

10. *SALIX foliis integerrimis lanceolatis longissimis utrinque virentibus*. Willow with the longest Spear-shaped, entire Leaves, green on both Sides. *Salix minimè fragilis, foliis longissimis, utrinque viridibus non serratis*. D. Sberard. Raii Syn. 2. p. 293. The least brittle Willow, with very long Leaves green on both Sides and not sawed.

11. *SALIX foliis serratis glabris linearilanceolatis, ramis pendulis*. Hort. Cliff. 454. Willow with smooth, sawed, linear, Spear-shaped Leaves, and hanging Branches. *Salix Orientalis, flagellis deorsum pulchrè pendentibus*. Tourn. Cor. 41. The Weeping Willow.

12. *SALIX foliis serratis glabris lanceolato-linearibus, superioribus oppositis obliquis*. Flor. Leyd. 83. Willow with linear, Spear-shaped, smooth, sawed Leaves, the upper obliquely opposite. *Salix humilior foliis angustis subcæruleis ex adverso binis*. Raii Syn. 2. p. 297. The yellow Dwarf Willow.

13. *SALIX foliis ovatis rugosis, subtus tomentosis undatis superne denticulatis*. Flor. Leyd. Prod. 83. Willow with oval rough Leaves which are waved, woolly on their under Side, and indented towards the Top. *Salix latifolia rotunda*. C. B. P. 474. Broad round-leaved Willow, or Sallow.

14. *SALIX foliis oblongo-ovatis acuminatis rugosis, subtus tomentosis*. Willow with oblong, oval, acute-pointed, rough Leaves, woolly on their under Side. *Salix folio ex rotunditate acuminato*. C. B. P. 474. Willow with a rounded, acute-pointed Leaf, or common Sallow.

The 1st Sort is the common white Willow, found growing on the Sides of Rivers and Ditches in many Parts of England. It grows to a large Size, if the Branches are not lopped off; the Shoots are covered with a smooth, pale, green Bark; the Leaves are Spear-shaped, between 3 and 4 Inches long, and one broad in the Middle, drawing to a Point at each End; they are very white on their under Side, and their upper is covered with short white woolly Hairs, though not so closely as the under; the Katkins are short and pretty thick. The Wood of this Sort is very white, and polishes smooth.

The 2d Sort grows to be a large Tree, the young Branches are covered with a grayish Bark; the Leaves are smooth, of a lucid green, ending in acute Points; they are eared at their Base, and sawed on their Edges, and green on both Sides; the Branches grow pretty erect and are flexible, so this is frequently planted in Osier Grounds for the Basket-makers. The Katkins of this are long, narrow, and the Scales open, and acute-pointed.

The 3d Sort hath thick strong Shoots, covered with a dark green Bark; the Leaves are broad, rounded at both Ends; the are very smooth, sawed on their Edges, and when rubbed have a grateful Odour. It is sometimes called the Bay-leaved Willow, and at others the Sweet Willow; it grows quick, and is a Tree of mid-

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dling Size; the Branches are brittle, so are not proper for many Purposes.

The 4th Sort has slender tough Shoots, of a yellow Colour; the Leaves are oval, acute-pointed, smooth, and sawed on their Edges; the Saws are cartilaginous, and the Foot-Stalks of the Leaves have callous Punctures. This is very pliable, so is much planted in the Osier Grounds for the Basket-makers, but it never grows to a large Size.

The 5th Sort grows to a pretty large Size; the Shoots are erect, and covered with a light green Bark; the Leaves are Spear-shaped, about 2 Inches and a Half long, and three Quarters of an Inch broad in the Middle, drawing to a Point at both Ends; they are of a lucid green on both Sides, sawed on their Edges, standing upon short Foot Stalks; they have Stipulæ in Form of a Trapezium, at the Base of the Foot Stalk. The Twigs are flexible, and fit for the Use of Basket-makers.

The 6th Sort grows to a middling Size; the Shoots are very brittle, so are unfit for the Basket-makers, and are covered with a brownish Bark; The Leaves are near 5 Inches long and one broad, they are of a lucid green on both Sides, and sawed on their Edges; the Katkins are long and slender, and the Scales pretty long, acute-pointed, and stand open. It is commonly called Crack Willow, from the Branches being very brittle.

The 7th Sort is a Tree of middling Size; the Shoots are very pliable, and fit for the Basket-makers, so is much planted in the Osier Grounds; they are of a reddish Colour; the Leaves are Spear-shaped, smooth, and sawed on their Edges; Those on the lower Part of the Branches are placed opposite, but on the upper they are alternate, and of a yellowish green.

The 8th Sort makes very long Shoots, but the Tree seldom grows to a large Size; the Leaves are very long and entire, and are set close upon the Branches; they are of a dark green on their upper Side, but very woolly and white on their under, ending in acute Points, and stand on very short Foot Stalks: The young Branches of this Sort are woolly, and their Buds very turgid. This is pretty much planted in the Osier Grounds, for the Use of Basket-makers.

The 9th Sort is a Tree of middling Growth; it casts its Bark annually; the Shoots are brittle, they have a yellowish Bark; the Leaves are Spear-shaped, and sawed on their Edges; they are eared on both Sides at their Base, and all placed alternate, being of a light green on both Sides. This Sort is not very commonly cultivated, the Twigs being too brittle.

The 10th Sort hath very pliant Branches, so is much planted in the Osier Grounds. The Leaves are very long, Spear-shaped and entire, and green on both Sides. It grows to a middling Size, if planted in moist Land.

The 11th Sort grows naturally in the Levant, but has been several Years cultivated in the English Gardens. This will grow to a middling Size; the Branches are long, slender, and hang down on every Side, so form natural Arches; the Leaves are narrow, Spear-shaped, smooth, and sawed on their Edges. It is well known in the Gardens, by the Title of Weeping Willow.

The 12th Sort is a Tree of Lower Growth; the Branches are erect; the Leaves smooth, narrow, Spear-shaped,

shaped, and sawed on their Edges; they are of a dark or bluish green, and toward the upper Part of the Branches are placed opposite. It is found by the Side of Ditches, in many Parts of *England*.

The 13th Sort grows naturally on dry Land, and high Situations, but rarely is seen of a large Size; the Bark is of a dark gray Colour, and smooth; the Branches are brittle, so are unfit for Basket-makers, but it is frequently cultivated in Hedges, and for Fuel in many Parts of *England*: It is called Mountain Osier. The Leaves are oval, rough, and woolly, and indented toward the Top; they are about an Inch and a Half long, and one Inch broad, rounded at both Ends, and have short Foot Stalks. There is a Variety of this in the Gardens with variegated Leaves.

The 14th Sort is the common Sallow; this differs from the last, in having longer Leaves which end in acute Points; they are woolly on their under Side, and sit closer to the Branches; they are not distinguished by the Farmers, who cultivate them equally.

There are some other Sorts of Willows planted in the Osier Grounds, and distinguished by the Basket makers and Dealers in them, under Titles which they have applied to them, which are little known to others; these are annually cut down, and always kept low, but when they are not cut down, and have Room to grow, rise to a considerable Height, and become large Trees; so that they may be planted for the same Purposes as the first Sort, and will make a Variety when intermixed with it, though they are commonly cultivated for their Twigs, which produce good Profit to the Owner of the Land.

All the Sorts of Willows may be easily propagated by planting Cuttings or Sets, either in the Spring or Autumn, which readily take Root, and are of quick Growth. Those Sorts which grow to be large Trees, and are cultivated for their Timber, are generally planted from Sets, which are about 7 or 8 Feet long; these are sharpened at their larger End, and thrust into the Ground by the Sides of Ditches and Banks, where the Ground is moist; in which Places they make a considerable Progress, and are a great improvement to such Estates, because their Tops will be fit to lop every 5th or 6th Year. This is the usual Method now practised in most Parts of *England*, where the Trees are cultivated, as they are generally intended for present Profit; but if they are designed for large Trees, or are cultivated for their Wood, they should be planted in a different Manner; for those planted from Sets of 7 or 8 Feet long always send out a Number of Branches toward the Top, which spread, and form large Heads fit for lopping, but their principal Stem never advances in Height; therefore, where Regard is paid to that, they should be propagated by short young Branches, which should be put almost their whole Length in the Ground, leaving only two or at most but three Buds out of the Ground, and, when these have made one Year's Shoot, they should be all cut off except one of the strongest and best situated, which must be trained up to a Stem, and treated as Timber Trees. If these are planted with such Design, the Rows should be 4 Feet asunder, and the Sets two Feet Distance in the Rows; by planting them so close, they will naturally draw each other upward, and,

when they are grown so large, as to cover the Ground and meet, they should be gradually thinned, so as at the last to leave every other Row, and the Plants in the Rows about 8 Feet asunder. If they are so treated, the Trees will grow to a large Size, and rise with upright Stems to the Height of 40 Feet or more.

When these Cuttings are planted, it is usual to sharpen those Ends to a Point, which are put into the Ground, for the better thrusting them in, but the best Way is to cut them horizontally just below the Bud or Eye, and to make Holes with an Iron Instrument in the Ground where each Cutting is to be planted, and, when they are put in, the Ground should be pressed close about the Cuttings with the Heel to settle it, and prevent the Air from penetrating to the Cuttings.

The after Care must be to keep them clear from Weeds the two first Seasons, by which Time they will have acquired so much Strength, as to over-power and keep down the Weeds; they will also require some Trimming in Winter to take off any lateral Shoots, which, if suffered to grow, would retard their upright Progress.

There are great Tracts of Land in *England* fit for this Purpose, which at present produce little to the Owners, and might, by planting these Trees, turn to as good Account as the best Corn Land. The larger Wood, if found, is commonly sold for making wooden Heels, or Soles for Shoes; as also to the Turners for many Kinds of light Ware.

The Sallows are commonly planted in Cuttings made from strong Shoots of the former Year, and are about 3 Feet long; these are commonly thrust down two Feet deep into the Ground, leaving one Foot above it. The Cuttings should be placed about 3 Feet Row from Row, and 18 Inches asunder in the Rows, observing always to plant the Rows the sloping Way of the Ground (especially if the Tides overflow the Place); because, if the Rows are placed the contrary Ways, all the Filth and Weeds will be detained by the Sets, which will choke them up.

The best Season for planting these Cuttings in the Osier Grounds is in *February*, for if they are planted sooner, they are apt to peel, if it proves hard Frost, which greatly injures them. These Plants are always cut every Year, and, if the Soil be good, they will produce a great Crop, so that the yearly Produce of one Acre has been often sold for 15 Pounds, but 10 Pounds is a common Price, which is much better than Corn Land, so that it is great Pity these Plants are not more cultivated, especially upon moist boggy Soils, where few other Things will thrive.

SALSOLA. *Lin. Gen. Pl.* 275. *Kali. Tourn. Inst. R. H.* 247. *Tab.* 128. *Glasswort*; in *French, Soude*.

The Characters are,

The Empalement of the Flower is permanent, and composed of 5 oval obtuse Leaves; The Flower has no Petals, but hath 5 short Stamina inserted in the Divisions of the Petals; it hath a globular Germen, with a short two-pointed Style, crowned by recurved Stigmas. The Germen becomes a globular Capsule, with one Cell wrapped up in the Empalement, inclosing one large Seed.

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The Species are,

1. *SALSOLA herbacea, foliis subulatis mucronatis, calycibus ovatis axillaribus.* Lin. Sp. Pl. 222. Herbaceous *Salsola* with Awl-shaped sharp-pointed Leaves, and oval Empalements proceeding from the Sides of the Stalks. *Kali spinosum foliis crassioribus & brevioribus.* Tragum. Matth. 1035. Prickly Glasswort with shorter and thicker Leaves.

2. *SALSOLA herbacea, foliis linearibus mucronatis, calycibus obtusis axillaribus.* Herbaceous *Salsola* with linear acute-pointed Leaves, and obtuse Empalements proceeding from the Sides of the Stalks. *Kali spinosum, foliis longioribus & angustioribus.* Tourn. Inst. 247. Prickly Glasswort with longer and narrower Leaves.

3. *SALSOLA herbacea, foliis inermibus.* Guett. Stamp. 426. Herbaceous *Salsola* with smooth Leaves. *Kali majus cochleato semine.* C. B. P. 287. Greater Glasswort with a cochleated Seed.

4. *SALSOLA frutescens, foliis ovatis acutis carnosiss.* Lin. Sp. Pl. 223. Shrubby *Salsola* with oval, fleshy, acute-pointed Leaves. *Kali fruticosum Hispanicum, tamarisci folio.* Tourn. Inst. R. H. 247. Shrubby Spanish Glasswort with a Tamarisk Leaf.

5. *SALSOLA herbacea, foliis subulatis mucronatis calycibus explanatis.* Lin. Sp. Pl. 222. Herbaceous *Salsola* with pointed Awl-shaped Leaves, and spreading Empalements. *Kali humile, alis purpureis florem roseaceum mentientibus.* Buxb. Cent. 1. p. 9. Dwarf Glasswort having purple Wings which resemble a Rose Flower.

The 1st Sort grows naturally in the Salt Marshes in divers Parts of England; it is an annual Plant which rises about 5 or 6 Inches high, sending out many Side Branches from the Bottom, which spread out wide on every Side; these are garnished with short Awl-shaped Leaves which are fleshy, and terminate in acute Spines. The Flowers are produced from the Sides of the Branches, to which they sit close, and are encompassed by short prickly Leaves; they are small, and of an herbaceous Colour. The Seeds are wrapped up in the Empalement of the Flower, and ripen in Autumn, soon after which the Plants decay.

The 2d Sort grows naturally on the sandy Shores of the South of France, Spain, and Italy; this is also an annual Plant, which sends out many diffused Stalks a Foot and a Half long, garnished with linear Leaves an Inch long, ending with sharp Spines. The Flowers come out from the Side of the Stalks as those of the former; their Empalements are blunt, and not so closely encompassed with Leaves as those of the other.

The 3 Sort rises with herbaceous Stalks, near 3 Feet high, sending out hoary Branches their whole Length, which at Bottom spread out wide, but toward the Top are short. The Leaves on the principal Stalk, and those on the lower Part of the Branches, are long, slender, and have no Spines; those on the upper, slender, short, and crooked. At the Base of the Leaves are produced the Flowers, which are small and hardly perceptible; the Empalement of the Flower afterward encompasses the Capsule, which contains one cochleated Seed. This Sort in warm Countries produces its Flowers in June, and the Seeds ripen in August, but in this Country the Plants scarce ever flower, unless the

Summer is very warm. This Plant is cultivated about Montpellier in Salt Marshes, in order to make *Sal Alkali*.

The 4th Sort grows naturally in Spain; this hath shrubby perennial Stalks, which rise 3 or 4 Feet high, sending out many Side Branches, garnished with fleshy, oval, acute-pointed Leaves, coming out in Clusters from the Side of the Branches; they are hoary, and have no stiff Prickles. The Flowers are produced from between the Leaves toward the Ends of the Branches; they are so small as scarce to be discerned, unless closely viewed. The Seeds are like those of the other Kinds.

The 5th Sort grows naturally in Tartary; this is an annual Plant, whose Stalks are herbaceous, and seldom rise more than 5 or 6 Inches high. The Leaves are Awl-shaped, ending in acute Points; the Empalements of the Flowers spread open; the Flowers are small, and of a Rose Colour, but soon fade; the Seeds are like those of the other Sorts.

All the Sorts of Glasswort are sometimes promiscuously used for making the *Sal Alkali*, but it is the third Sort which is esteemed best for this Purpose. The Manner of making it is as follows: Having dug a Trench near the Sea, they lay Laths across it, on which they lay the Herb in Heaps, and having made a Fire below, the Liquor, which runs out of the Herbs, drops to the bottom, which at length thickening becomes *Sal Alkali*, which is partly of a black, and partly of an Ash Colour, very sharp and corrosive and of a saltish Taste. This, when thoroughly hardened, becomes like a Stone, and is there called *Soude* or *Sode*. It is transported from thence to other Countries for making Glass.

SALT is a fossil Body, fusible by Fire, and congealable again, in the Cold, into brittle Glebes or Crystals; soluble withal in Water, so as to disappear therein; never malleable, and having something in it which, to the Organ of Taste, affords a Sensation of Acrimony and Sharpness.

Dr. Grew supposes, That the chief governing Principle in the Juices of Plants is the Saline or Salt, which saline Principle is to be understood as a general Term. The vegetable Salts seem to be four; viz. the Nitrous, the Acid, the Alkaline, and the Marine.

The nitrous Salts seem by Nature to be assigned chiefly to the Growth of Plants, and the other three Salts are exhibited by the several Ways of resolving the Principles of a Plant.

Salt is accounted good for cold Lands, because the Nature of it is such, that the drier and hotter it is kept, the more it keeps its own Body, and does not turn to Water; but, when it stands in a cold moist Place, in a little Time it dissolves to Water, and when turned to Water, is fit for the Nourishment and Feeding of Plants, especially Annuals.

The Reason why Salt, viz. Salt Water, is accounted a Feeder of Seeds or Plants, is, that it has been often observed that Salt falling on a Board, &c. will be long a drying; and, if it has been dried by Heat, Dews or Rain will make it moist again, and then it steams forth, and that is it which nourishes all Plants; but, if

if it be upon a hot and dry Ground, late in the Spring, and dry Weather comes, it does not, nor can, yield its Steam or Fume.

Pigeons Dung is by many esteemed good for cold Lands, because it is hotter and saltier than any other Dung, it being natural to Pigeons to eat Salt, for they fly to the Sea Side early on Mornings to pick up the Salt, which the Heat of the Sun makes by drying up the Salt Water, and leaves upon the Sand.

The Rev. Dr. Hales, in his excellent Treatise of Vegetation, observes, That Plants are of a less durable Texture, as they abound with a greater Proportion of Salt and Water, which is not so strongly attracted as Sulphur and Air, so they are the less able to endure the Cold; and, as Plants are observed to have a greater Proportion of Salt and Water in them in the Spring than in Autumn, they are more easily injured by Cold in the Spring, than in a more advanced Age, when their Quantity of Oil is increased, with their greater Maturity.

Whence we find, that Nature's chief Business in bringing the Parts of a Vegetable, especially its Fruit and Seed, to a Maturity, is to combine together, in a due Proportion, the more active and noble Principles of Sulphur and Air, that chiefly constitute Oil, which in its most refined State is never found without some Degree of Earth and Salt in it.

Common Salt, if it could be obtained at a reasonable Rate, would be an excellent Dressing for most Lands, but the exorbitant Duty, which is laid upon it, renders it too expensive to be used for this Purpose, so that it is needless to mention its Usefulness.

SALVIA. Tourn. Inst. R. H. 180. Tab. 83. Lin. Gen. Pl. 36. Sage; in French, *Sauge*.

The Characters are,

The Empalement of the Flower is tubulous, of one Leaf, striated, and large at the Mouth, where it is cut into 4 Parts. The Flower is of the Lip Kind of one Petal; the lower Part is tubulous; the upper Part is large and compressed; the upper Lip is concave, incurved, and indented at the Point; the lower Lip is broad and trifid, the middle Segment being large, roundish, and indented. It has 2 short Stamina which stand transverse to the Lip, and are fixed in the Middle to the Tube, to whose Tops are fixed Glands, upon the upper Side of which sit the Summits; it has a four-pointed Germen supporting a long slender Style, situated between the Stamina, crowned by a bifid Stigma. The Germen becomes four roundish Seeds which ripen in the Empalement.

The Species are,

1. *SALVIA foliis lanceolatis-ovatis integris crenulatis, floribus verticillato-spicatis*. Sage with Spear-shaped, oval, entire Leaves slightly crenated on their Edges, and Flowers growing in whorled Spikes. *Salvia major*. C. B. P. The greater Sage.

2. *SALVIA foliis infimis cordatis, summis oblongo-ovatis serratis tomentosis, floribus verticillato-spicatis*. Sage with Heart-shaped lower Leaves, the upper oblong, oval, sawed, and woolly, and Flowers growing in whorled Spikes. *Salvia latifolia serrata*. C. B. P. 237. Broad-leaved sawed Sage.

3. *SALVIA foliis lanceolatis sepius articulatis subtus tomentosis, floribus spicato-verticillatis, calycibus ventricosis*.

Sage with Spear-shaped Leaves which are frequently eared, and woolly, on their under Side, Flowers growing in whorled Spikes, and bellied Empalements. *Salvia minor aurita & non aurita*. C. B. P. 237. Smaller Sage with Leaves earless and eared, commonly called Sage of Virtue.

4. *SALVIA foliis lineari-lanceolatis integerrimis tomentosis, floribus spicatis calycibus brevissimis ventricosis acutis*. Sage with linear, Spear-shaped, woolly, entire Leaves, spiked Flowers, and the shortest bellied Empalements ending in acute Points. *Salvia Hispanica Lavendulae folio*. Tourn. Inst. R. H. 181. Spanish Sage with a Lavender Leaf.

5. *SALVIA foliis infimis pinnatis, summis ternatis rugosis, floribus spicatis, caule fruticoso tomentoso*. Sage with winged lower Leaves, the upper ones trifoliate and rough. Flowers growing in Spikes, and a shrubby woolly Stalk. *Salvia orientalis absinthium redolens, foliis pinnatis, flore carneo elatior*. Sberard. Aët. Phil. Lond. 383. Taller Eastern Sage with a Wormwood smell, winged Leaves, and a flesh-coloured Flower.

6. *SALVIA foliis lanceolato-ovatis integris crenulatis floribus spicatis, calycibus obtusis*. Hort. Cliff. 12. Sage with Spear-shaped, oval, entire Leaves slightly crenated, spiked Flowers, and blunt Empalements. *Salvia Cretica frutescens pomifera, foliis longioribus incanis & crispis*. Tourn. Cor. 10. Shrubby Apple-bearing Sage of Crete with longer, hoary, and curled Leaves.

7. *SALVIA foliis compositis pinnatis*. Hort. Cliff. 13. Sage with compound winged Leaves. *Salvia orientalis, latifolia, birsutissima, viscosa, pinnata, flore & calyce purpureis inodora*. Boerb. Ind alt. 1. p. 167. Eastern, broad-leaved, hairy, unfavoury Sage with clammy winged Leaves, and the Flowers and Empalements purple.

8. *SALVIA foliis infimis pinnatis, summis simplicibus crenatis, floribus verticillatis caulibus procumbentibus birsutissimis*. Sage with winged lower Leaves, the upper ones single and crenated, Flowers growing in Whorls, and the most hairy trailing Stalks. *Salvia orientalis, latifolia, absinthium redolens, flore carneo magno*. Boerb. Ind. alt. 1. p. 167. Eastern, broad-leaved Wormwood Sage with a large Flesh coloured Flower.

9. *SALVIA foliis cordatis obtusis crenatis subtomentosis, corollis calyce angustioribus*. Lin. Sp. Pl. 25. Sage with Heart-shaped, blunt, crenated Leaves somewhat woolly and the Petals narrower than the Empalement. *Velezia Monier*. The *Velezia* of Dr. Monier.

10. *SALVIA foliis subrotundis integerrimis, basi truncatis dentatis*. Hort. Cliff. 13. Sage with roundish entire Leaves which are torn, and indented at their Base. *Salvia Africana frutescens, folio subrotundo glauco, flore magno aureo*. Hort. Amst. 2. p. 183. Shrubby African Sage with a roundish gray Leaf, and a large golden Flower.

11. *SALVIA foliis subrotundis serratis, basi truncatis dentatis*. Hort. Cliff. 13. Sage with roundish sawed Leaves which are torn, and indented at their Base. *Salvia Africana frutescens, folio socradoniae, flore violaceo*. Hort. Amst. 2. p. 18. Shrubby African Sage with a Wood Sage Leaf, and a Violet Flower.

12. *SALVIA foliis oblongo-ovatis integerrimis, calycibus patulis coloratis*. Tab. 225. fig. 2. Sage with oblong, oval,

oval, entire Leaves, and spreading coloured Empalements.

The 1st Sort is the common large Sage cultivated in Gardens, of which there are the following Varieties: 1. The common green Sage. 2. The Wormwood Sage. 3. The green Sage with a variegated Leaf. 4. The red Sage. 5. The red Sage with a variegated Leaf; these are accidental Variations, and therefore are not enumerated as Species. The common Sage grows naturally in the southern Parts of *Europe*, but is here cultivated in Gardens for Use, but that Variety with red or blackish Leaves is the most common in the *English* Gardens, and the Wormwood Sage is in greater plenty here than the common green-leaved Sage, which is but in few Gardens. The common Sage is so well known, as to require no Description.

The 2d Sort is generally titled Balsamick Sage by the Gardeners. The Stalks of this do not grow so upright as those of the common Sage; they are very hairy, and divide into several Branches, garnished with broad Heart-shaped woolly Leaves standing upon long Foot Stalks; they are sawed on their Edges, and their upper Surfaces are rough; the Leaves, which are upon the Flower Stalks, are oblong and oval, standing on shorter Foot Stalks, and very slightly sawed on their Edges; the Flowers grow in whorled Spikes toward the Top of the Branches; the Whorls are pretty far distant, and but few Flowers in each; they are of a pale blue, and about the Size of those of the common Sort. It flowers in *June*, and in good Seasons the Seeds ripen in Autumn. This Sage is preferred to all the others for making Tea.

The 3d Sort is the common Sage of Virtue, which is also well known in the Gardens and Markets. The Leaves of this are narrower than those of the common Sort; they are hoary, and some of them indented on their Edges toward the Base, which Indentures have the Appearance of Ears. The Spikes of Flowers are longer than those of the two former Sorts, and the Whorls are generally naked, having no Leaves between them. The Flowers are smaller, and of a deeper blue than those of the common red Sage.

The 4th Sort grows naturally in *Spain*. The Leaves of this are very narrow and entire, standing in Clusters on the Side of the Stalks; they are very hoary, and the Branches covered with a hoary Down; the Leaves on the upper Part of the Stalk are narrower than those of Rosemary; the Flowers grow in closer Spikes than either of the former, and are of a light blue Colour.

The 5th Sort grows naturally about *Smyrna*, from whence the late Dr. William Sherard sent the Seeds, which succeeded in the *Chelsea* Garden. This rises with a shrubby Stalk 4 or 5 Feet high, and divides into several Branches which grow erect. The Leaves on the lower Branches are winged, being composed of 2 or 3 Pair of small Lobes terminated by one large one. Those which grow on the flowering Branches are trifoliate, the two inner Lobes being small, and the outer one is large, ending in a Point; they have the Flavour of the Wormwood, and their upper Surface is rough. The Flowers grow in long Spikes at the End of the Branches; the Whorls are pretty close

to each other, and have no Leaves between them; the Flowers are long, and of a flesh Colour. This flowers in *July*, but never produces good Seeds in *England*.

The 6th Sort grows naturally in *Crete*; this hath a shrubby Stalk, which rises 4 or 5 Feet high, dividing into several Branches; garnished with Spear-shaped, oval, woolly Leaves which are entire, and slightly crenated on their Edges. The Flowers grow in Spikes at the End of the Branches; they are of a pale blue Colour, and have obtuse Empalements. The Branches of this Sage have often Punctures made in them by Insects, at which Places grow large Protuberances as big as Apples in the same Manner as the Galls upon the Oak, and the rough Balls on the Briars.

The 7th Sort grows naturally in the *Levant*; this is an annual Plant with trailing Stalks. The Leaves on the lower Part of the Stalks are composed of two or three small Pair of Lobes terminated by one large one; those farther up are trifoliate, the outer Lobe being 4 Times the Size of the Side ones. The Flowers grow in Whorls round the Stalks; they are large, and of a deep blue Colour, as are also their Empalements. This flowers in *July*, and the Seeds ripen in Autumn, soon after which the Plants decay.

The 8th Sort grows naturally about *Smyrna*, where the late Dr. Sherard gathered the Seeds; this is a perennial Plant, with trailing Stalks which grow near 2 Feet long, garnished toward the Bottom with Leaves composed of two Pair of small Lobes terminated by a large one, but those toward the Top are single, and stand opposite. The Flowers are produced in Whorls round the Stalks; they are large, and of a flesh Colour, but are not succeeded by Seeds here.

The 9th Sort grows naturally at *Mexico*; this is an annual Plant, which rises with an erect, four-cornered, branching Stalk 3 Feet high, garnished with large Heart-shaped Leaves of a bright green Colour, obtusely crenated on their Edges, having several Veins on their lower Side, which diverge from the Mid-rib to the Sides. Their Foot Stalks are long and slender; the Flowers are produced in close Spikes at the End of the Branches; they are of a fine blue Colour, and their Tubes are narrower than the Empalement. It flowers in *July*, and the Seeds ripen in Autumn.

The 10th Sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby Stalk 7 or 8 Feet high, covered with a light-coloured Bark, sending out Branches the whole Length, which grow almost horizontally; they are garnished with roundish gray Leaves which are entire, and seem torn at their Base, where they are also indented. The Flowers are produced in thick short Spikes at the End of the Branches; they are very large, and of a dark Gold Colour; they appear in *May* and *June*, but are not succeeded by Seeds in *England*.

The 11th Sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby Stalk 4 or 5 Feet high, dividing into Branches, garnished with oval sawed Leaves of a gray Colour, which have one or two Indentures at their Base that seem torn. The Flowers come out in Whorls toward the End of the Branches; they are of a fine blue Colour, and larger than those of the common Sage; these appear in Succession most of the

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the Summer Months, and those, which come early, are often succeeded by Seeds which ripen in Autumn.

The 12th Sort has been lately raised in the *Dutch Gardens* from Seeds brought from the *Cape of Good Hope*. It has great Resemblance to the former, but the Branches are stronger and grow more erect; the Leaves are longer and not so broad; their Edges are not sawed; the Flowers grow in long loose Spikes at the End of the Branches; they are larger, and of a paler blue than the other, and their Empalements are broader, spread wider, and are of a pale blue Colour, in which consists their Difference.

All the Sorts of Sage may be propagated by Seeds, if they can be procured; but, as some of them do not perfect their Seeds in *England*, and most of the Sorts, but especially the common Kinds for Use, are easily propagated by Slips, it is not worth while to raise them from Seeds. The Slips should be planted the Beginning of *April* on a shady Border, where, if they are now and then refreshed with Water, if the Season should prove dry, they will soon take Root. When the Slips have made good Roots, they may be taken up with Balls of Earth to their Roots, and transplanted where they are to remain, which should always be upon a dry Soil, and where they may have the Benefit of the Sun, for if they are planted on a moist Soil, or shady Situation, they are very subject to be destroyed in Winter, nor will these Plants endure the Cold so well, when planted on a rich Soil, as those which have a barren, dry, rocky Soil, which is the Case of most of the verticillate Plants, for these will often grow upon Walls, where, although they are more exposed to the Cold than those Plants in the Ground, they are always found to remain in severe Winters when the others are destroyed. The Side Shoots and Tops of these Plants may be gathered in the Summer, and dried, if designed for Tea, otherwise they are best taken green from the Plants for most other Uses. The Roots of the common Sorts of Sage will last several Years, if they are in a dry warm Soil, but, where they are often cropped for Use, the Plants will become ragged, so there should be a Succession of young ones raised every other Year.

The 5th, 6th, and 8th Sorts are somewhat tender, so will not live through the Winter in the open Air in *England*, therefore these must be planted into Pots filled with fresh, light, sandy Earth, and in Winter must be removed under a hot Bed Frame, that they may have a great Share of fresh Air whenever the Season is mild, for if they are too much drawn, they seldom flower well, and make but an indifferent Appearance. In Summer they must be exposed among other exotics, in some well-sheltered Situation, for they are pretty hardy, and only require to be sheltered from the Frost. These Plants must be often refreshed with Water in warm Weather, otherwise they will shrivel and decay, and they should be new-potted at least twice every Summer, because their Roots will greatly increase, which, if confined in the Pots too long, will turn mouldy, and decay.

The 7th and 9th Sorts are annual Plants so are only propagated by Seeds; these may be sown on a Bed of light Earth in the Places where they are to remain.

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The Seeds of the 7th Sort should be sown in Autumn, and then the Plants will come up the following Spring, but, if they are kept out of the Ground till Spring, the Plants will not come up till the next Year. Those of the 9th Sort may be sown the Beginning of *April* on a warm Border, where the Plants will appear in *May*, and require no other Care but to thin them where too close, and keep them clean from Weeds, and, if they should grow tall, they must be supported, otherwise the strong Winds will break them down, but the 7th Sort spreads its Branches upon the Ground, so will require no Support, therefore this only requires to have Room, and to be kept clean from Weeds.

The 10th, 11th, and 12th Sorts are Natives of a warmer Country, so these require Protection in Winter; they are easily propagated by Cuttings in the Spring and Summer Months. If these are planted early in the Spring, it will be the better Way to plant them in Pots, which should be plunged into a very moderate hot Bed, and, if they are shaded from the Sun in the Heat of the Day, and gently refreshed with Water as they may require it, they will have put out good Roots in about two Months, when they should be inured gradually to the open Air, into which they should be removed soon after. The Cuttings, which are raised early in the Season, will become strong Plants before Winter, so will be in a better Condition to resist the Cold than those which are weak.

If the Cuttings are planted in Summer, they will require no artificial Heat, so that if they are planted on a Bed of fresh loamy Earth, and covered close down with a Bell or Hand Glass, and shaded from the Sun in the Heat of the Day, giving them now and then a little Water, they will take Root freely, and when they begin to shoot, they should have free Air admitted to them by raising the Glass on one Side, and so gradually exposed to the open Air. When they are well-rooted, they should be each transplanted into a separate small Pot filled with fresh light Earth, and placed in a shady Situation till they have taken new Root; then they may be removed to a sheltered Situation, where they may remain till the Approach of Frost, when they must be carried into Shelter, and in Winter treated as other hardy Green-house Plants, which only require Protection from Frost, observing not to over-water them during the cold Weather, but in Summer, when they are in the open Air they will require it often.

SALVIA AGRESTIS. See *Teucrium*.

SAMBUCUS. *Tourn. Infl. R. H.* 606. *Tab.* 376. *Lin. Gen. Pl.* 334. The Elder-tree; in *French*, *Sureau*.

The Characters are,

The Flower has a small permanent Empalement of 1 Leaf cut into 5 Parts; it has 1 concave Wheel-shaped Petal cut into 5 obtuse Segments at the Brim which are reflexed, and 5 Awl-shaped Stamina, the Length of the Petal, terminated by roundish Summits, with an oval Germen situated under the Flower, having no Style, in Room of which is a swelling Gland, crowned by 3 obtuse Stigmas. The Germen becomes a roundish Berry with one Cell including three angular Seeds.

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The Species are,

1. *SAMBUCUS caule arboreo ramoso, floribus umbellatis.* Flor. Leyd. Prod. 243. Elder with a branching Tree-like Stalk, and Flowers growing in Umbels. *Sambucus fructu in umbellâ nigro.* C. B. P. 456. Common Elder with black Berries growing in an Umbel.

2. *SAMBUCUS foliis pinnatifidis, floribus umbellatis, caule fruticoso ramoso.* Elder with Wing-pointed Leaves, Flowers growing in Umbels, and a shrubby branching Stalk. *Sambucus laciniato flore.* C. B. P. 456. Cut-leaved Elder, commonly called Parsley-leaved Elder.

3. *SAMBUCUS racemis compositis ovatis, caule arboreo.* Lin. Sp. Pl. 270. Elder with oval compound Bunches of Flowers, and a Tree-like Stalk. *Sambucus racemosa rubra.* C. B. P. 456. Red-berried Mountain Elder.

4. *SAMBUCUS caule herbaceo ramoso, foliis dentatis.* Tab. 226. Elder with a branching herbaceous Stalk, and the small Leaves indented. *Sambucus humilis sive Ebulus.* C. B. P. 456. Dwarf Elder, or Ebulus.

5. *SAMBUCUS caule herbaceo ramoso foliolis linearilanceolatis acutè dentatis.* Elder with an herbaceous branching Stalk, and linear Spear-shaped Lobes sharply indented. *Sambucus humilis, sive Ebulus folio laciniato.* C. B. P. 456. Dwarf Elder, or Ebulus, with a cut Leaf.

The 1st Sort here mentioned is the common Elder, so well known as to need no Description; of this there are the following Varieties, viz. The white and green berried Elder, and the variegated leaved Elder. The latter is undoubtedly a Variety, but I much doubt if the white is not a distinct Species, for the Lobes of the Leaves are much less, and are very slightly sawed on their Edges, whereas those of the common Sort are deeply sawed; they are also smoother and of a lighter green; and the Plants which have been raised from the Berries, have not altered, so there is great Reason for supposing them different Species; but as I have made but one Trial of this, I am unwilling to determine upon a single Experiment, so shall leave it as a Doubt till further Trial is made.

The 2d Sort is generally titled Parsley-leaved Elder, by the Gardeners; this is by some supposed to be only a Variety of the first, but there can be little Reason for doubting of its being a distinct Species. The Lobes of these Leaves are narrower than those of the first, and cut into several Segments; these are again deeply indented on their Edges regularly, in Form of winged Leaves. The Stalks of this are much smaller than those of the first, and the Shoots are short; the Leaves have not so strong an Odour, and their Berries are a little smaller.

The 3d Sort grows naturally upon the Mountains in Germany and Italy; this sends up many shrubby Stalks from the Root, which rise 10 or 12 Feet high, and divide into many Branches, covered with a brown Bark; the Leaves come out opposite, those on the lower Part of the Branches are composed generally of two Pair of Lobes, terminated by an odd one; these are shorter and broader than those of the common Elder, and are deeply sawed on their Edges; the Leaves on the upper Part of the Branches have frequently but 3 Lobes, they are of a pale green Colour, and pretty smooth. The Flowers come out at the End of the Shoots in oval Bunches, composed of several smaller;

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they are of an herbaceous white Colour, and appear in April; these are sometimes succeeded by Berries, which are red when ripe.

The 4th Sort grows naturally in many of the midland Counties in England, where it is frequently a troublesome Weed in the Fields; this is called Dwarf Elder, Danewort, and Walwort. It hath creeping Roots which spread far in the Ground on every Side, so propagates very fast where-ever it gets Possession; the Stalks are herbaceous, and rise from 3 to 5 Feet high, in Proportion to the Goodness of the Ground, and send out a few Side Branches toward the Top; they are garnished with winged Leaves, composed of 6 or 7 Pair of narrow Lobes, terminated by an odd one; they are about 4 Inches long, and one broad near the Base, ending in acute Points; they are of a deep green, a little indented on their Edges, and placed by Pairs along the Mid-rib. The Flowers grow in Umbels at the Top of the Stalks, they are of the same Form with those of the common Elder, but are smaller, and spotted with red. These appear in July, and are succeeded by black Berries like those of the common Elder, but smaller.

This Plant is frequently used in Medicine; it purges serous watery Humours by Stool, and is therefore much recommended for the Dropsy, in which Disorder I have known the Juice of this Plant perform Wonders in a short Time; it was administered three Times a Week, two Spoonfuls was the Dose given at each Time. It is also accounted a good Medicine for the Gout, and scorbutick Disorders. The young Shoots of the common Elder are frequently sold for this in the Markets, from which it may be easily distinguished, by the Number and Shape of the Lobes on each Leaf: The common Elder has seldom more than 5 Lobes to each Leaf, which are broader and much shorter than those of the Dwarf Elder, and pretty deeply sawed on their Edges, but the Leaves of the Dwarf Elder have 9, 11, or 13 Lobes to each Leaf, which are long, narrow, and very slightly indented on their Edges.

The Roots of the 5th Sort do not creep so much in the Ground as those of the 4th; the Stalks are herbaceous, but do not rise so high, and are closer garnished with Leaves, which have seldom more than 7 Lobes to each, and toward the Top of the Stalks but 5; these are long and narrower than those of the former, and deeply cut on their Edges, ending with winged acute Points. The Flowers are produced in Umbels at the Top of the Stalks, which are shaped like those of the former, and are succeeded by the like Berries.

The three first Sorts may be easily propagated from Cuttings, or by sowing their Seeds; but the former, being the most expeditious Method, is generally practised. The Season for planting their Cuttings is any Time from September to March, in doing which, there needs no more Care than to thrust the Cuttings about 6 or 8 Inches into the Ground, and they will take Root fast enough, and may afterwards be transplanted where they are to remain, which may be upon almost any Soil or Situation; they are extreme hardy, and if their Seeds are permitted to fall upon the Ground, they will produce Plenty of Plants the succeeding Summer.

These Trees are often planted for making Fences, because of their quick Growth; but as their Bottoms

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become naked in a few Years, they are not so proper for that Purpose; neither would I recommend them to be planted near Habitations, because at the Season when they are in flower, they emit such a strong Scent, as will occasion violent Pains in the Heads of those who abide long near them; besides, the crude Parts continually perspired through their Leaves, are accounted unwholesome, though the Leaves, Bark, and other Parts, are greatly esteemed for many Uses in Medicine.

The 4th Sort propagates itself fast enough wherever it is once planted, by its creeping-Roots, so that it is very difficult to keep it within Bounds, therefore is not a proper Plant for Gardens; but those inclined to keep it for medicinal Use, need only plant one or two of the Roots in any abject Part of a Garden or Field, and the Place will soon be spread over with it.

The 5th Sort is preserved in Botanick Gardens for Variety, but is seldom admitted into other Gardens. This propagates by the Root, though not so fast as the other.

The common Elder will grow upon any Soil, or in any Situation; the Trees are frequently seen growing on the Top, and out of the Side of old Walls; and they are often seen growing close to Ditches, and in very moist Places; so that where-ever the Seeds are scattered, the Plants will come up, as they often do from the Hollow of another Tree. The Leaves and Stalks of this Plant are so bitter and nauseous, that few Animals will browse upon it. I have often seen the Trees growing in Parks, where there has been Variety of Animals, and have observed they were untouched, when almost all the other Trees within Reach have been cropped by the Cattle.

The young Shoots of this Tree are strong and very full of Pith, but as the Trees grow old, their Wood becomes very hard, and will polish almost as well as that of the Box Tree, so is often used for the same Purposes, where Box Wood is scarce.

The Bark, Leaves, Flowers, and Berries of this Tree, are used in Medicine. The inner Bark is esteemed good for Dropsies, the Leaves are outwardly used for the Piles and Inflammations. The Flowers are inwardly used to expel Wind, and the Berries are esteemed cordial and useful in hysterick Disorders, and are frequently put into Gargarisms for sore Mouths and Throats.

SAMOLUS. *Tou'n. Inst. R. H. 143. Tab. 60. Lin. Gen. Pl. 205.* Round-leaved Water Pimpernel.

The Characters are,

The Empalement of the Flower is permanent, erect, and cut into 5 Segments. It has one Petal, with a short spreading Tube; the Brim is plain, obtuse, and cut into 5 Parts. It has 5 short Stamina placed between each Segment of the Petal, terminated by Summits which join together. The Germen is situated under the Flower, supporting a slender Style, crowned by a beaded Stigma. The Germen becomes an oval Capsule with one Cell, cut half through into 5 Valves, filled with small oval Seeds.

We have but one Species of this Plant, which is,

SAMOLUS *valerandi. J. B.* Round-leaved Water Pimpernel.

This Plant grows wild in swampy Places, where the Water usually stands in Winter, and is seldom preserved in Gardens. It is an annual Plant which flowers in

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June, and the Seeds are ripe in August; at which Time, whoever hath a Mind to cultivate it, should sow the Seeds on a moist Soil, where the Plants will come up, and require no father Care, but to keep them clear from Weeds.

SAMYDA. *Lin. Gen. Pl. 525. Guidonia. Plum. Nov. Gen. Tab. 24.*

The Characters are,

The Flower has a rough Bell-shaped Empalement of one Leaf, cut at the Brim into 5 Points; which spread open. It has no Petal, but has 15 short Awl-shaped Stamina, inserted in the Empalement, terminated by oval Summits, and a hairy globular Germen, supporting a cylindrical Style crowned by a beaded Stigma. The Germen becomes an oval Berry with 4 Furrows having 4 Cells, including many Kidney-shaped Seeds immersed in the oval Receptacle.

The Species are,

1. SAMYDA *foliis ovatis serratis, floribus axillaribus.* Samyda with oval sawed Leaves, and Flowers growing from the Wings of the Stalks. *Guidonia ulmi foliis, flore roseo. Plum. Nov. Gen. 4.* Guidonia with Elm Leaves and a Rose-coloured Flower.

2. SAMYDA *foliis compositis pinnatis.* Samyda with compound winged Leaves. *Guidonia nucis juglandis folio. Plum. Nov. Gen. 4.* Guidonia with a Walnut Tree Leaf.

These Plants grow naturally in the West-Indies; the first Sort rises with a shrubby Stalk 5 or 6 Feet high, sending out several weak Branches, garnished with oval Leaves drawing to a Point; they are an Inch and a Half long, and one Inch broad, sawed on their Edges, and of a light green Colour. The Flowers come out from the Wings of the Leaves on short Foot Stalks, they have a 5 leaved Empalement, of a bright red within; the Stamina which are about 15 in Number, are inserted in the Middle of the Empalement, and stand erect; and in the Center is situated an oval Germen which turns to a Berry with 4 Cells, containing small Seeds.

The other Sort has Leaves shaped like those of the Walnut Tree, but smaller, and the Inside of the Empalement is of a purple Colour, in which it differs from the first.

These Plants are propagated by Seeds, which must be procured from the Countries where they naturally grow; these must be sown upon a hot Bed in the Spring, and when the Plants come up, they must be planted in small Pots filled with good Kitchen Garden Earth, and plunged into a hot Bed of Tanners Bark, and treated as other tender Plants from the same Countries. They must be always kept in the Bark Bed in the Stove, otherwise they will make but little Progress in England.

SAND, as Dr. Boerhaave defines it, is Earth properly so called, which is a fossil Body, neither dissoluble by Fire, Water, nor Air; insipid and untransparent, more fusible than Stone, still friable, and containing usually a Share of Fatness.

Dr. Lister divides the English Sands into two Classes; the first sharp or rag Sand, consisting of small transparent Pebbles, naturally found on the Mountains, and not calcinable; these he farther divides into fine and coarse, and subdivides each, according to the Colours into white, gray, reddish, brown, &c.

The

The 2d, soft or smooth, which he subdivides into that with flat Particles broken from Lime Stones, that with Silver-like Particles, and that with Gold-like Particles.

As to Sand, its Use is to make the clayey Earth fertile, and fit to feed Vegetables, &c. for Earth alone, we find, is liable to coalesce, and gather into a hard coherent Mass, as is apparent in Clay; and Earth thus embodied, and, as it were, glued together, is no Way disposed to nourish Vegetables; but if with such Earth, Sand, &c. i. e. hard Crystals, which are not dissolvable in Water, and still retain their Figure, be intermixed, they will keep the Pores of the Earth open, and the Earth itself loose and incompact, and by that means give Room for the Juices to ascend, and for Plants to be nourished thereby.

Thus a Vegetable, planted either in Sand alone, or in a fat Glebe, or Earth alone, receives no Growth or Increment at all, but is either starved or suffocated; but mix the two, and the Mass becomes fertile. In Effect, by Means of Sand, the Earth is rendered, in some Manner, organical; Pores and Interstices being hereby maintained, something analogous to Vessels, by which the Juices may be conveyed, prepared, digested, circulated, and at Length excerned, and thrown off into the Roots of Plants.

Grounds that are sandy and gravelly, easily admit both of Heat and Moisture; but then they are liable to these Inconveniencies, that they let them pass too soon, and so contract no Ligature, or else retain it too long, especially where there is a Clay Bottom; and by that Means it either parches or chills too much, and produces nothing but Moss and cankerous Infirmities; but if the Sand happens to have a Surface of good Mould, and a Bottom of Gravel or loose Stone, though it do not hold the Water, it may produce a forward sweet Grass; and though it may be subject to burn, yet it quickly recovers with the least Rain.

Sea Sand is accounted a very good Compost for stiff Ground, for it effects the two Things following, viz. It makes Way for the Tree or Seed to root in stiff Ground, and makes a Fume to feed it.

Sand indeed is apt to push the Plants that grow upon it, early in the Spring, and make them germinate near a Month sooner than those that grow upon Clay, because the Salts in the Sand are at full Liberty to be raised and put into Motion, upon the least Approach of the Warmth of the Sun; but then as they are hasty, they are soon exhaled and lost.

SANGUINARIA. Dill. Hort. Elth. 252. Lin. Gen. Pl. 570. Puccoon.

The Characters are,

The Empalement of the Flower is composed of 2 oval, concave Leaves, which fall away. It has 8 oblong, obtuse, spreading Petals, which are alternately narrow. It has many single Stamina, shorter than the Petals, terminated by single Summits, and an oblong compressed Germen having no Style, crowned by a permanent thick Stigma, with two Channels. The Germen becomes an oblong bellied Capsule with two Valves pointed at both Ends, inclosing round acute-pointed Seeds.

We have but one Species of this Genus, viz.

SANGUINARIA. Hort. Cliff. 202. Puccoon. This is

the *Cbelidonium majus*, *Canadense acaulon*. Corn. Canad. 212. Greater Celandine of Canada having no Stalks.

There are some other Varieties of this Plant mentioned in the Eltham Garden, but they are not distinct Species, for they vary annually, therefore it is to no Purpose to mention their Variations.

This Plant was formerly ranged in the Genus of *Celandine*, by the Title of *Cbelidonium maximum Canadense acaulon*; and this Name of *Sanguinaria* was applied to it by Dr. Dillenius, who was Professor of Botany at Oxford. We have no proper English Name for this, but as the Inhabitants of America call it by the Indian Name Puccoon, I have continued it here.

It is a Native of most of the northern Parts of America, where it grows plentifully in the Woods; and in the Spring, before the Leaves of the Trees come out, the Surface of the Ground is, in many Places, covered with the Flowers, which have some Resemblance to our Wood Anemone, but they have short naked Pedicles, each supporting one Flower at the Top. Some of these Flowers will have 10 or 12 Petals, so that they appear to have a double Range of Leaves, which has occasioned their being termed double Flowers; but this is only accidental, the same Roots in different Years producing different Flowers. The Roots of this Plant are tuberous, and the whole Plant has a yellow Juice, which the Indians use to paint themselves.

This Plant is hardy enough to live in the open Air in England, but it should be planted in a loose Soil and a sheltered Situation, but not too much exposed to the Sun. It is propagated by the Roots, which may be taken up and parted every other Year; the best Time for doing this is in September, that the Roots may have Time to send out Fibres before the hard Frost sets in. The Flowers of this Plant appear in April, and when they decay, the green Leaves come out, which will continue till Midsummer; then they decay, and the Roots remain inactive till the following Autumn; so that unless the Roots are marked, it will be difficult to find them, after their Leaves decay, for they are of dirty brown Colour on the Outside, so are not easily distinguished from the Earth.

This Plant is very proper to mix with the Dogs-tooth Violet, Spring Cyclamen, Persian Iris, Bulbocodium, Sisyrinchium, and some other low growing bulbous and tuberous rooted Flowers, which require the same Culture; where these will add to the Variety when they are in Beauty; for when the Roots are strong and grow in a good Soil, they will produce a great Number of Flowers upon each Root; the Roots may be planted about 4 or 5 Inches asunder every Way.

SANGUIS DRACONIS. See Palma.

SANGUISORBA. Lin. Gen. Pl. 136. Pimpinella. Tournef. Inst. R. H. 156. Tab. 69. Burnet, called by the French Pimpernel.

The Characters are,

The Empalement of the Flower is composed of 2 short Leaves placed opposite, which fall away. The Flower hath 1 plain Petal, cut into 4 obtuse Segments, which join at their Base. It has 4 Stamina the Length of the Petal, terminated by small roundish Summits, and a 4 cornered Germen situated between the Empalement and Petal, supporting a short slender Style, crowned by an obtuse Stigma.

The Germen turns to a small Capsule with two Cells, filled with small Seeds.

The Species are,

1. SANGUISORBA *spicis ovatis*. Hort. Cliff. 39. Sanguisorba with oval Spikes. *Pimpinella sanguisorba major*. C. B. P. 160. Greater Burnet.

2. SANGUISORBA *spicis cylindricis, foliolis cordato-oblongis, rigidis, serratis*. Sanguisorba with cylindrical Spikes, the Lobes of the Leaves oblong, Heart-shaped, stiff, and sawed. *Pimpinella major, rigida, præalta, auriculata, subauda*. Bocc. Mus. 2. 19. Taller acid great Burnet of Savoy, with eared Leaves.

3. SANGUISORBA *spicis orbiculatis compactis*. Sanguisorba with round compact Spikes. *Pimpinella major Hispanica alera, conglomerata flore*. H. R. Par. Another great Burnet of Spain, with a conglomerated Flower.

4. SANGUISORBA *spicis longissimis*. Hort. Cliff. 39. Sanguisorba with the longest Spikes. *Pimpinella maxima Canadensis*. Corn. 174. Greatest Canada Burnet.

The 1st Sort grows naturally in moist Meadows in divers Parts of England; the Stalks rise from 2 to near 3 Feet high, branching toward the Top, and are terminated by thick oval Spikes of Flowers, of a grayish brown Colour, divided into 4 Segments almost to the Bottom. These appear in June, and are each succeeded by 4 oblong cornered Seeds, which ripen in August. The Leaves are composed of 5 or 6 Pair of Lobes placed along a Mid-rib, terminated by an odd one; the Lobes are about 2 inches long, and one broad at their Base, drawing narrower to the Point; they are thin, sawed on their Edges, and a little downy on their under Side.

The 2d Sort grows naturally in Piedmont; this rises with stiff upright Stalks more than 3 Feet high, branching out toward the Top, each Branch being terminated by a cylindrical Spike of brown Flowers, shaped like those of the former Sort, but smaller. The Leaves are long, their Foot Stalks very strong, and much longer than those of the first Sort; the Leaves have 7 or 8 Pair of stiff Lobes, terminated by an odd one; these are oblong, Heart-shaped, deeply sawed on their Edges, of a lucid green on their upper Side, but pale on their under, having pretty long Foot Stalks, at the Base of which come out 2 small roundish Leaves or Ears, deeply indented. This retains its Difference when propagated by Seeds, so is undoubtedly a distinct Species.

The Leaves of the third Sort are smaller than those of the first, having but 4 Pair of Lobes to each, terminated by an odd one; these are bluntly sawed on their Edges, and have very short Foot Stalks; they are of a pale green on their upper Side, and hoary on their under. The Stalks rise about 2 Feet high, branch pretty much toward their Top, and are terminated by round Heads or Spikes of reddish Flowers, which appear in July, and are succeeded by Seeds which ripen in Autumn. It grows naturally in Spain.

The 4th Sort grows naturally in North America; this hath Leaves like those of the first Sort, but a little stiffer; they are composed of 4 or 5 Pair of Lobes, terminated by an odd one; those on the lower Part of the Mid-rib stand alternate, but the 2 upper Pair are opposite; they are of a light green Colour, and deeply sawed on their Edges. The Stalks rise 3 Feet high, dividing toward the Top into small Branches,

which stand erect, and are terminated by long Spikes of Flowers of an herbaceous white Colour, each standing upon a short Foot Stalk.

There is another with long Spikes of red Flowers, which grows naturally in the same Countries, whose Stalks rise higher; the Spikes of Flowers are thicker, the Lobes of the Leaves broader, and whiter on their under Side; but whether this is a distinct Species, or an accidental Variety of the fourth, I cannot as yet determine.

All these Sorts are very hardy perennial Plants, and will thrive in almost any Soil or Situation. They may be propagated either by Seeds or parting the Roots; if they are propagated by Seeds, they should be sown in the Autumn, for when they are sown in the Spring, they seldom grow the same Year: When the Plants come up, they must be kept clean from Weeds, till they are strong enough to transplant, when they may be planted in a shady Border at about 6 Inches Distance each Way, observing to water them till they have taken new Root, after which they will require no other Care but to keep them clean from Weeds till Autumn, when they may be transplanted to the Place where they are to remain; the following Summer they will produce Flowers and Seeds, but their Roots will abide many Years.

If the Roots are parted, it should be done in Autumn, that they may get good Root before the dry Weather comes on in the Spring.

The other Sorts of Burnet are referred to the Article *Poterium*.

SANICULA. Tourn. Inst. R. H. 326. Tab. 173. Lin. Gen. Pl. 289. Sanicle.

The Characters are,

It is a Plant with an umbellated Flower. The universal Umbel hath but few Rays, and the Involucrum is situated but half round on the Outside; the partial Umbels have many clustered Rays, and their Involucra surround them on every Side; the Emplacement of the Flower is scarce discernable; the Flowers have 5 compressed Petals which are bifid, and turn inward; they have 5 erect Stamina, twice the Length of the Petals, terminated by roundish Summits, and a bristly Germen situated under the Flower, supporting 2 Awl-shaped Styles, which are reflexed, crowned by pointed Stigmas. The Germen becomes a rough oval-pointed Fruit dividing into two Parts, each containing one Seed.

There is but one Species of this Plant at present in England; viz.

SANICULA *officinaria*. C. B. P. Sanicle, or Self-heal.

This Plant is found wild in Woods, and shady Places, in most Parts of England, but being a medicinal Plant may be propagated in Gardens for Use. It may be increased by parting the Roots, any Time from September to March, but it is best to do it in Autumn, that the Plants may be well rooted before the dry Weather in Spring comes on; they should have a moist Soil, and shady Situation, in which they will thrive exceedingly.

SANTOLINA. Tourn. Inst. R. H. 460. Tab. 260. Lin. Gen. Pl. 847. Lavender-cotton; in French, *Petit Cyprès*, or *Garderoche*.

The Characters are,

It hath a compound Flower with a scaly hemispherical Emplacement. The Flower is uniform, composed of many hermaphrodite

hermaphrodite Florets longer than the Empalement; these are Funnel-shaped, and cut into 5 Parts at the Top which turns backward; they have 5 very short Hair-like Stamina terminated by cylindrical Summits, and an oblong four-cornered Germen, supporting a slender Style, crowned by two oblong, depressed, torn Stigmas. The Germen becomes a single oblong four-cornered Seed, either naked, or crowned with very short Down, ripening in the common Empalement.

The Species are,

1. *SANTOLINA pedunculis unifloris, foliis quadrifariam dentatis.* Hort. Cliff. 397. Lavender-cotton with one Flower on a Foot Stalk, and Leaves indented four Ways. *Santolina foliis teretibus.* Tourn. Inst. 460. Common Lavender-cotton.

2. *SANTOLINA pedunculis unifloris, calycibus globosis, foliis quadrifariam dentatis tomentosis.* Lavender-cotton with one Flower on a Foot Stalk, globular Empalements, and woolly Leaves indented four Ways. *Santolina flore majore, foliis villosis & incanis.* Tourn. Inst. 460. Lavender-cotton with a larger Flower, and hoary Leaves.

3. *SANTOLINA pedunculis unifloris, caulibus decumbentibus, foliis linearibus quadrifariam dentatis.* Lavender-cotton with one Flower on a Foot Stalk, declining Foot Stalks, and linear Leaves four Ways indented. *Santolina repens & canescens.* Tourn. Inst. 460. Creeping hoary Lavender-cotton.

4. *SANTOLINA pedunculis unifloris, foliis linearibus longissimis bifariam dentatis.* Lavender-cotton with one Flower on a Foot Stalk, and very long linear Leaves two ways indented. *Santolina foliis obscure virentibus, flore aureo.* Tourn. Inst. 461. Lavender-cotton with dark-green Leaves, and golden Flowers.

5. *SANTOLINA pedunculis unifloris, capitulis globosis, foliis linearibus integerrimis.* Lavender-cotton with one Flower on a Foot Stalk, globular Heads, and linear entire Leaves. *Santolina foliis rosmarini major.* Tourn. Inst. 491. Great Lavender-cotton with Rosemary Leaves.

6. *SANTOLINA pedunculis unifloris, foliis linearibus confertis obtusis.* Lavender-cotton with one Flower on a Foot Stalk, and linear obtuse Leaves growing in Clusters. *Santolina foliis rosmarini minor.* Tourn. Inst. 461. Smaller Lavender-cotton with Rosemary Leaves.

7. *SANTOLINA pedunculis unifloris, foliis longioribus tomentosis, duplicato dentatis.* Lavender-cotton with one Flower on a Foot Stalk, and longer woolly Leaves twice indented. *Santolina incana chamæmeli odore suaviora.* Boerb. Ind. alt. 123. Hoary Lavender-cotton with a soft Chamomile Scent.

8. *SANTOLINA corymbis simplicibus fastigiatis, foliis linearibus confertis.* Tab. 227. fig. 1. Lavender-cotton with single Corymbuses of Flowers closed together at the Top, and linear Leaves growing in Clusters. *Coma aurea abrotani folio annua.* Pont. Diff. 177. Annual Goldylocks with a Southernwood Leaf.

9. *SANTOLINA corymbis simplicibus fastigiatis, foliis trilobis cuneiformibus.* Lin. Sp. Pl. 843. Lavender-cotton with single Corymbuses of Flowers closed together at the Top, and Leaves having three Wedge-shaped Lobes. *Coma aurea Africana fruticans, foliis glaucis & in extremitate trifidis.* Hort. Amst. 2. p. 97. Shrubby African Goldylocks with gray Leaves cut into three Parts at their Ends.

10. *SANTOLINA corymbis simplicibus fastigiatis, foliis semitrifidis linearibus.* Lin. Sp. Pl. 843. Lavender-cotton with single Corymbuses closed together at the Top and linear Leaves half divided into three Points. *Coma aurea Africana fruticans, foliis erithmi marini.* Hort. Amst. 2. p. 99. Shrubby African Goldylocks with a Samphire Leaf.

11. *SANTOLINA corymbis simplicibus coarctatis, foliis pinnatifidis dentatis.* Lin. Sp. Pl. 842. Lavender-cotton with single Corymbuses closely joined together, and indented Wing-pointed Leaves. *Elicbrysum inodorum glabrum, coronopi folio, annuum magnoli.* H. L. 228. Annual, smooth, unfavoury Goldylocks with a Hartshorn Leaf.

12. *SANTOLINA corymbis compositis fastigiatis, foliis inferioribus linearibus dentatis superioribus ovatis serratis.* Hort. Cliff. 398. Lavender-cotton with compound Corymbuses closed together at the Top, the under Leaves linear and indented, and the upper-oval and sawed. *Coma aurea Africana frutescens, foliis inferioribus incisis, superioribus dentatis.* Com. Rar. Plant. 41. Shrubby African Goldylocks with cut lower Leaves, and the upper ones indented.

The 1st Sort is the common Lavender-cotton known in the English Gardens; it was formerly tilled *Abrotanum femina*, or female Southernwood, and by the Corruption of Words was called Brotany by the Market People; it grows naturally in Spain, Italy, and the warm Parts of Europe. This hath a shrubby Stalk dividing into many ligneous Branches, garnished with slender hoary Leaves, four Ways indented, and which have a rank strong Odour when handled. The Branches divide toward the Top into several slender Stalks, whose lower Parts are garnished with a few small Leaves of the same Shape as the other, but naked above, and terminated by a single Flower composed of many hermaphrodite Florets which are fistular, and cut into 5 Parts at the Top; they are of a Sulphur Colour, included in one common scaly Empalement, and have no Borders or Rays. These appear in July, and are succeeded by small oblong striated Seeds which are separated by scaly Chaff, and ripen in the Empalement; these will rise near 3 Feet high in a dry Soil and a sheltered Situation. The Leaves, and sometimes the Flowers, are used in Medicine, and are reputed good to destroy Worms; it is sometimes called *Chamacyparissus*, or Dwarf Cypress.

The 2d Sort has a shrubby Stalk which Branches out like the Former, but the Plants seldom grow so tall. The Branches are divided into a greater Number of Stalks which are short, hoary, and garnished very closely below with Leaves shaped like those of the other Sort, but shorter, thicker, and whiter; the Flowers are much larger, and the Brims of the Florets more reflexed; they are of a deeper Sulphur Colour than the other, but appear at the same Time. It grows naturally in Spain.

The 3d Sort is of lower Stature than either of the former, seldom rising more than 15 or 16 Inches high. The Branches spread horizontally near the Ground, and are garnished with shorter Leaves than either of the former; these are hoary, and finely indented; the Stalks are short, and are terminated by single Flowers of a bright yellow Colour, which are larger than those of the first Sort.

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The 4th Sort rises higher than either of the former. The Branches are more diffused; they are slender, smooth, and garnished with very narrow long Leaves, of a deep green Colour, and but two Ways indented; the Stalks are slender, naked toward the Top, and terminated by single Flowers of a Gold Colour, which appear at the same Time with the former.

The 5th Sort hath shrubby Stalks, which rise about three Feet high, sending out long slender Branches, garnished with single linear Leaves about an Inch and a Half long, of a pale green Colour, and entire. The Stalks are terminated by large single globular Flowers, of a pale Sulphur Colour, which appear about the same Time as the former.

The 6th Sort is somewhat like the 5th, but the Branches are shorter, thicker, and closer garnished with Leaves, which come out in Clusters; they are shorter, and have blunt Points. The Flower Stalks are sparsely disposed, and have Leaves at their Top; the Flowers are small and of a yellow Colour.

The 7th Sort hath shrubby Stalks which rise near three Feet high, and divide into many Branches which are hoary, and garnished with broader Leaves than either of the former, whose Indentures are looser but double; they are hoary, and when bruised have an Odour like Chamomile. The Leaves are placed pretty far asunder, and the Stalks garnished with them to the Top. The Stalks are divided likewise at the Top into 2 or 3 Foot Stalks, each sustaining one pretty large Sulphur-coloured Flower.

The 8th Sort is an annual Plant which grows naturally in the *Mediterranean*; this rises with herbaceous slender Stalks 2 Feet high, which are stiff and hoary, sending out Branches at Distances on every Side, which diminish in their Length to the Top; these are garnished with short linear Leaves in Clusters, and cut at their Points into three Parts; they have an agreeable Odour when bruised. The Branches are terminated by small Clusters of Flowers of a bright yellow which appear in *August*, but, unless the Season proves very warm, the Seeds never ripen in *England*.

The 9th Sort grows naturally at the *Cape of Good Hope*, from whence it was brought to *Holland*, and propagated in some curious Gardens there, but has since been dispersed to most of the *European* Gardens; this rises with a shrubby Stalk, 5 or 6 Feet high, sending out slender Branches garnished with short flat Leaves cut into three Parts at the Top; they are of a gray Colour, and sit close to the Branches. The Flowers are disposed in a single Corymbus at the End of the Branches, and are very closely connected together; they are of a pale Sulphur Colour, and have roundish scaly Empalements. This Sort flowers great Part of Summer, but seldom produces good Seeds in *England*.

The 10th Sort is also a Native of the *Cape of Good Hope*; this hath a shrubby Stalk very like the former, but the Leaves of this are linear, and cut half their Length into three Points, and sometimes into five. The Flowers are like those of the former Sort, and appear most of the Summer Months.

The 11th Sort grows naturally in *Africa*; this is an annual Plant which rises with herbaceous Stalks about 9 Inches high; these divide into 2 or 3 Branches, gar-

nished with smooth Leaves, indented on their Edges like those of the Buckthorn Plantain. The Flowers are produced in a close single Corymbus at the End of the Branches; they are of a bright yellow, and appear in *August*, but, unless the Autumn proves very warm, the Seeds do not ripen in *England*.

The 12th Sort grows naturally at the *Cape of Good Hope*; this hath a low shrubby Stalk dividing into several Branches which are first green, but afterward turn of a brown Colour; they are garnished with two Sorts of Leaves; those on the lower Part are oblong, and cut on their Edges into acute Points, but the upper are short, stiff, and slightly indented at their Ends. The Flowers are disposed in a compound Corymbus at the End of the Branches; they are of a pale yellow, appear early in Summer, and frequently ripen their Seeds in Autumn.

The first of these Plants is cultivated in Gardens for medicinal Use, and the six next are propagated by the Gardeners near *London* for furnishing Balconies, and other little Places in and near the City, by Way of Ornament. The 7 Sorts first mentioned are hardy Plants which will thrive in the open Air, provided they are planted in a poor dry Soil, for in such Ground the Plants will be stunted, so will be hard and better able to resist the Cold, and will have a better Appearance than those which are in rich Ground, whose Branches will be long and diffused, so by hard Rains or strong Winds are displaced, and sometimes broken down.

All these Plants may be cultivated so as to become Ornaments to a Garden, particularly in small Bosquets of ever-green Shrubs, where, if artfully intermixed with other Plants of the same Growth, and placed in the front Line, they will make an agreeable Variety, especially if Care be taken to trim them twice in a Summer to keep them within Bounds, otherwise their Branches are apt to straggle, and in wet Weather to be borne down and displaced, which renders them unsightly; but, when kept in Order, their hoary and different-coloured Leaves have a pretty Effect in such Plantations.

These Plants may be propagated by planting Slips or Cuttings of any of the Kinds during the Spring, which should be put into a Border of light fresh Earth, and watered and shaded in hot dry Weather, until they have taken Root; after which they will require no further Care, but to keep them clear from Weeds till Autumn, when they should be carefully taken up, and transplanted where they are to remain; but, if the Ground is not ready by that Time to receive them, it will be proper to let them remain in the Border until Spring, for if they are transplanted late in Autumn, they are liable to be destroyed by Cold in Winter.

The 8th and 11th Sorts are annual Plants, so are propagated only by Seeds; these must be sown the latter End of *March* on a moderate Bed, and when the Plants appear, they should be treated as the Balsamine, and other hardy Kinds of Annuals, and the latter End of *May*, they should be carefully transplanted into a warm Border of light Earth, where they will flower, and in warm Seasons will perfect their Seeds.

The other Kinds are too tender to live through the Winter in the open Air in *England*, so they are kept in Pots, and removed into the green-house in Autumn; but,

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but, as these only require Protection from hard Frost, they must not be treated too tenderly, for then their Branches will be weak and unsightly, therefore they should be placed with the more hardy exotick Plants, where they may have a large Share of Air whenever the Season is mild. These are easily propagated by planting Cuttings any Time in Summer, which must be shaded till they have taken Root.

SAP: The Notion of the Sap's Circulation was entertained by several Authors much about the same Time, without any Communication from one another, particularly M. Major, a Physician of Hamburg, M. Perrault, Mariotte, and Malpighi. It has met, however, with some considerable Opposers, particularly the excellent M. Dodart, who could never be reconciled to it.

One of the great Arguments for it is, That the same Experiments of Ligature and Incision, which evince a Circulation of the Blood in Animals, succeed in the like Manner in Plants, particularly in such as abound with a milky Sap, as the Great Tithymale, Milk-thistle, &c. if the Ligature be fastened tight round round them, the Part above is found to swell very considerably, and that below it a little, whence it appears, that there is a Juice descending from the Branches, and that the latter is thicker than the former, which quadrates exactly with the common System, the Juice being supposed to arise in capillary Vessels in Form of a subtile Vapour, which condensed in the Extremes of the Plant by the Neighbourhood of the cold Air, turns back in Form of a Liquor through the more patent Pipes of the inner Bark.

M. Dodart, instead of the same Juice's going and returning, contends for two several Juices, the one imbibed from the Soil digested in the Root, and from thence transmitting to the Extremes of the Branches for the nourishing of the Plant, the other received from Moisture of the Air entering in at the Extremities of the Branches and surfaces of the Leaves, so that the ascending and descending Juices are not the same.

One of his chief Arguments is, That if two Trees of the same Kind be transplanted in one Day, after first cutting off their Roots and Branches, and if, after they have taken Root, some of the new Shoots put forth each Year be cut off one of them, it will not thrive half so well, notwithstanding its Root and Trunk being entire as the other.

This he conceives to be a Proof of the Plant's deriving Nourishment by the Branches, and concludes it to be of an aereal Nature, because formed of the Moisture of the Air, Dew, &c. whereas that imbibed from Soil is terrestrial, &c. *Hist. de l'Acad. Roy. Ann.* 1709.

The Humour or Sap of a Plant, then, is a Juice furnished by the Earth, and changed into the Plant, consisting of some fossil Parts, other Parts derived from the Air and Rain, and others from putrefied Animals, Plants, &c. Consequently in Vegetables are contained all Kinds of Salts, Oil, Water, Earth, &c. and probably all Kinds of Metals too, inasmuch as the Ashes of Vegetables always yield somewhat which the Loadstone attracts.

This Juice enters the Plant in Form of a fine and subtile Water, which the nearer it is to the Root, the

more it retains of its proper Nature, and the farther from the Root, the more Action it has sustained, and the nearer it approaches to the Nature of the Vegetable.

Consequently, when the Juice enters the Root, the Bark whereof is furnished with excretory Vessels fitted to discharge the excrementitious Part, it is earthy, watry, poor, acid, and scarce oleaginous at all.

In the Trunk and Branches it is further prepared though it still continues acid, as we see by taping or perforating of a Tree in the Month of February, when it distils a watry Juice apparently acid.

The Juice, being here carried to the Gems or Buds, is more concocted, and here, having unfolded the Leaves, these come to serve as Lungs for the Circulation and further Preparation of the Juice.

For these tender Leaves, being exposed to the alternate Action of Heat and Cold, moist Nights, and hot scorching Days, are alternately expanded and contracted, and the more on Account of their reticular Texture.

By such Means is the Juice still further altered and digested, as it is further in the Petala or Leaves of the Flowers which transmit the Juice, now brought to a greater Subtlety, to the Stamina; these communicate it to the Farina or Dust in the Apices, which is, as it were, the male Seed of the Plant, where having undergone a further Maturation, it is shed into the Pistil, which performs the office of an Uterus or Womb, and thus having acquired its last Perfection, it gives Rise to a new Fruit or Plant.

The Root or Part, whereby Vegetables are connected to their Matrix, and by which they receive their nutritious Juice, consists of an infinite Number of absorbing Vessels, which, being dispersed through the Interstices of the Earth, attract or imbibe the Juices of the same. Consequently, every Thing in the Earth, that is dissoluble in Water, is liable to be imbibed, as Air, Salt, Oil, Fumes of Minerals, Metals, &c. and of these Plants really consist.

These Juices are drawn from the Earth very crude, but by the Structure and Fabrick of the Plant, and the various Vessels they are strained through, become changed, further elaborated, secreted, and assimilated to the Substance of the Plant.

The Motion of the nutritious Juices of Vegetables is produced much like that of the Blood in Animals, by the Action of the Air; in Effect, there is something equivalent to Respiration throughout the whole Plant.

The Discovery of this is owing to the admirable Malpighi, who first observed that Vegetables consist of two Series or Orders of Vessels:

1. Such as receive and convey the alimental Juices, answering to the Arteries, Lacteals, Veins, &c. of Animals.

2. Tracheae or Air Vessels, which are long hollow Pipes, wherein Air is continually received and expelled, i. e. inspired and expired; within which Tracheae he shews all the Former Series of Vessels are contained.

Hence it follows, that the Heat of a Year, nay, of a Day, of a single Hour, or Minute, must have an Effect on the Air included in these Tracheae. i. e. must rarefy it and consequently dilate the Tracheae, whence arises a perpetual Spring or Source of Action to promote the Circulation in Plants.

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For by the Expansion of the *Trachea*, the Vessels containing the Juices are pressed, and by that Means the Juice contained is continually propelled, and so accelerated, by which Propulsion the Juice is continually comminuted, and rendered more and more subtiler, and so enabled to enter the Vessels still finer and finer, the thickest Part of it being at the same Time secreted, and deposited into the lateral Cells or *Loculi* of the Bark to defend the Plant from Cold, and other external Injuries.

The Juice having thus gone its Stage from the Root to the remote Branches, and even the Flower, and having in every Part of its Progress deposited something both for Aliment and Defence, what is redundant passes out into the Bark, the Vessels whereof are inosculated with those wherein the Sap is mounted, and through these it re-descends to the Root, and then to the Earth again, and thus a Circulation is effected.

Thus is every Vegetable acted on by Heat and Cold, during the Day Time especially while the Sun's Force is considerable, the Sap Vessels squeezed and pressed, and the Sap protruded and raised, and at length evacuated, and the Vessels exhausted, and in the Night again, the same *Trachea* being contracted by the Cold of the Air, the other Vessels are eased and relaxed, and so disposed to receive fresh Food for the next Day's Digestion and Excretion.

What Course the Juice takes, after it is imbibed by the Roots, is not very clear. The Vessels that take it up, to convey to the Plant, are too fine to be traced, and hence it has been controverted, whether it is by the Bark, or the Pith, or the woody Part, that the Plant is fed.

The more common Opinion is for the Bark. The Juice, raised by the Capillaries of the Wood, is here supposed to descend by the larger Fibres, placed in the inmost Part thereof, immediately over the Wood, in which Descent, the Sap, now sufficiently prepared, adds a Part of its Substance to the contiguous Wood, and thus increases by Apposition, and hence it may be, that hollow, carious, or rotten Trees, which have neither Pith nor Wood, excepting just enough to sustain the Bark, grow and bear.

Some contend for the Wood, which they observe to consist of slender capillary Tubes running parallel to each other from the Root up the Trunk, being proper to receive in a fine Vapour; in the Ascent whereof the Fibres become open, and their Substance increased, and thus the Trunks of Trees are said to increase in their Circumference.

As for the Pith; as the woody Substance of the Trunk becomes more woody, the Pith is compressed and streightened to such a Degree, that in some Trees it quite disappears, whence it seems that its Office in Vegetation is not very important, since its Use is not perpetual. By its spongy Substance it should seem fitted to receive any superfluous Moisture, transuding through the Pores of the woody Fibres; and, if by the Excess of such Moisture, or the like Cause, it corrupt and rot, as it frequently happens in Elms, the Tree does not grow worse for it, which is a convincing Proof it is of no great Use.

The learned Dr. *Boerhaave* distributes the Juices of Plants into six Classes:

1. The first Class comprehends the crude nutritious Juice, or the Juices of the Root and Stem of Plants, which are little more than the mere Matter of the Element, as drawn by the Root from the Body it adheres to, whether it be Earth, Water, or the like.

This Juice is found in every Part of the Plant, and therefore may be held an universal Juice; yet he considers it as the Juice of the Root and Stem, because it is chiefly found in them.

This he takes to be a subacid watry Lymph without any specifick Taste or Smell, as not being yet arrived to the Maturity of Oiliness.

To this Class belong those Juices which distill in great Abundance from Wounds or Incisions made in the woody Parts of Plants; such, e. g. is that tart Liquor issuing from the Root of the Walnut Tree, when cut off in the Month of *May*.

Such also is that limpid subacid Humour flowing out very plentifully at an Incision in the Birch Tree, in the Month of *March*, to the Quantity of several Gallons in a few Days,

Such also is the Juice issuing out of the Vine wounded in the Spring Time, which always tastes tartish, and ferments like the Grapes themselves.

This Juice may be esteemed as yet fossil, being generated of and in the Earth, for the Juice of the Earth, being received into the Canals of this Plant, retains its Nature during two or three Circulations, nor doth it immediately commence a vegetable Juice.

This Class of Juices therefore he accounts as the Chyle of the Plant, being chiefly found in the first Order of Vessels; viz. in the Roots and the Body of the Plant, which answer to the Stomach and Intestines of Animals.

2. The second Class of the Juices is that of the Leaves, which are the real Lungs of Plants, and accordingly make a further Change of the Juice, which they receive from the Roots and Stem by Force of the Air. The Juice of Leaves is different therefore from the first Juice as being more sulphureous, and farther elaborated; not that it derives any Sulphur from the Sun, but that, its watery Part exhaling, it becomes more oily, and less volatile.

The Juice of Leaves he distinguishes into three Kinds:

The first is the nutritious Juice of the Leaves, which is that already described, only further elaborated in the minute *Vesiculæ* of the Leaves, and consequently less watry, and more oily and saccharine.

The second is Wax, which, exuding out of the Leaves, adheres to the Surface, and is scraped off by Bees with their rough Thighs to build their Combs withal. This is chiefly afforded by Lavender and Rosemary, upon the latter of which the Wax may be plainly perceived sticking to the Leaves of it.

The third is Manna, not that with which the *Israelites* were fed in the Desert, but a Drug sold among us; it is an essential saccharine Salt exuding chiefly by Night, and in the Summer Season, from the Leaves of a Sort of Ash growing in *Calabria* and *Sicily*, and adhering thereto in the Form of a Crust, to be gathered the next Morning ere the Sun is up.

The like Substance is found to exude from the Leaves

Leaves of the Linden Tree and Poplar, in the Heats of May and June, at which Time they have an Honey Taste, and are even seen with a fatty Juice on them, which, at the Approach of the cold Evening, gathers into Grains.

3. The third Class of Juices are those of Flowers, or the genital Parts of Plants: In these are,

First, A pure, elaborated, volatile Oil or Spirit, wherein the particular Smell of the Plant or Flower resides, and which, by Reason of its extreme Volatility, exhales spontaneously, inasmuch that if the Flower be laid for some Time in a warm Place, the odorous Juice or Spirit will be all fled.

The second is the Juice expressed from the Flower, which in reality is the same with that of the Root and Leaves, only farther prepared; it is thicker than the former, and has scarce any Smell at all. Thus, if you bruise a Hyacinth, or other fragrant Flower, and express the Juice, it will be found altogether inodorous.

The third is the sweet Juice called Honey, which exudes from all Flowers, Aloes, Colocynthis, and other bitter Flowers not excepted.

In all male Flowers, that have Utricles at the Bottom of the *Petalas*, which Dr. *Linnaeus* styles the *Nectarium*, is found a viscid, ruddy, sweet Juice in some Plenty, and accordingly we see the Children gather Cowslips, Dead Nettle, Honeyuckles, &c. and suck the Honey from them. The Bees too visit these Flowers, and, putting in their *Proboscides* or Trunks, suck out the Honey, and load their Stomachs therewith to be afterward discharged, and laid up in their Combs, so that Honey is a vegetable Juice.

4. The fourth Class of Juices are those of the Fruit and Seed, the Preparative whereof is Nature's final Work, which performed, the Plants seem to die for a Time, as all Animals are seen to languish after the Emission of their *Semen*.

The Juice of the Fruit is like that of the Root, only farther elaborated.

The Juice of the Seed is an essential Oil or Balm elaborated and exalted to its last Perfection. This Juice or Oil is not found in the very Point or Embryo in the Center of the *Placenta*; all we meet with in that Part is a few fine watry Particles secreted from the *Placenta*, but it is in the *Placentuli* or *Cotyledonis* themselves, which consist of innumerable little *Folliculi* or Cells, wherein this Juice is contained, serving to defend the Embryo, and preserve it from being corrupted by Water, which, it is well known, will hardly pass through Oil.

Thus, if you take, e. g. Fennel Seed, cut it through the Middle, and apply it to the Microscope, you will easily perceive a clear shining Oil in the Cells of each Lobe investing the tender Embryo. Without this Oil it were impossible a Seed should live a Month, and much less a Year or two, entire and uncorrupted in the Ground.

This Oil is found in the Seeds of all Plants; in some, ex gr. in Almonds, Cocoa Nuts, &c. in very great Quantities; in others less, as Pepper, Arum, &c. where one would scarce imagine any Oil at all; and these Seeds lose their vegetative Quality very soon.

5. The fifth Class of Juices are those of the Bark,

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which is an artful *Congeries* or Bundle of perspirative Ducts, and absorbent Vessels.

Of these Juices there are divers Species, for the several Humours raised and distributed through the Leaves, Flowers, and other Parts of the Plants, have all circulated through the Bark, and accordingly are frequently found to distil from Wounds made therein. In some Cases, even the whole Plant is no more than Bark, the Pulp having been eaten out, as in Willows, Elms, &c. which will live a long Time in that State.

The Bark serves divers Purposes, for it not only transmits the nutritious Juices of the Plant, but also contains divers fat oily Humours to defend the fleshy Parts from the Injuries of the Weather.

6. As Animals are furnished with a *Panniculus Adiposus*, usually replete with Fat which invests and covers all the fleshy Parts, and screens them from external Cold, so are Plants encompassed with a Bark replete with fat Juices, by the Means whereof the Cold is kept out, and in Winter Time the *Spiculae* of Ice prevented from fixing and freezing the Juices in their Vessels, whence it is that some Sorts of Trees remain ever-green the Year round, by Reason their Barks have more Oil than can be spent and exhaled by the Sun, and their Leaves are covered with a thick oily Film over their Surface, which prevents their perspiring so much as other Plants, and also defends them from the Cold, &c.

All the Juices of Barks are reducible to eight, viz.

1. The crude, acid, watry Juice, called the Chyle of the Plant.

2. An oily Juice, which, bursting the Bark in the Beginning of the Summer, exudes out of several Plants, as Cypress, Pine, Fir, Savin, Juniper, and other Evergreens, and such alone. This Oil dissolves by the smallest Degree of Warmth, and is easily inflamed, and is that which defends the Plant, which is the Reason why most of these Plants will not thrive in very hot Climates.

For Balm, or fatty Liquor, more glutinous than Oil, is nothing but the last-mentioned oily Juice, which was more fluid during the Spring Time, but which, by the greater Heat of the Sun, has evaporated all its most subtle Parts, and is converted into a denser Liquor. Thus the finer Part of Oil of Olives being exhaled by the Summer's Warmth, there remains a thick Balsam behind: Thus also Oil of Turpentine, having lost its more liquid Parts by Heat, becomes of the thick Consistence of a Balm.

3. A pithy Juice, which is the Body of the Oil itself, inspissates, and turns black, when put into a great Warmth: This is the most observed in the Pine and Fir.

5. Refin, which is an Oil so far inspissated, as to become friable in the Cold, may be procured from any Oil by boiling it much and long. Thus, if Turpentine be set over a gentle Fire, it first dissolves, and becomes an Oil, then a Balsam, then Pitch, and then a Refin, in which State it is friable in the Cold, fusible by Fire, withal inflammable and combustible, dissoluble in Spirit of Wine, but not in Water, which makes the Character of Refin.

Hence the Oil is most abundant in the Barks in the

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the Winter Time, the Balsams in Summer, and the Resin in Autumn.

6. Colophony, which is a Resin still farther exhausted of its volatile Part, being pellucid, friable, and approaching to the Nature of Glass.

7. Gum, which is an Humour exuding out of the Bark, and, by the Warmth of the Sun, concocted, inspissated, and rendered tenacious, but still dissoluble in Water, and at the same Time inflammable, and scarce capable of being pulverized. This oily Mucilage serves as a Pigment to cover over, and defend the Buds of Trees from the Injuries of the Wet and Frost in Winter, but will melt with a moist Warmth, and easily run from them, when the gentle Warmth of the Spring approaches, nor is ever so far hardened into a Crust, as to do any Injury to the inclosed Shoot. This oily Substance always contains in it an acid Spirit, which is a Preservative against Putrefaction.

8. A gummosus Resin, which is an Humour secreted in the Bark, and dried by the Heat of the Sun, and thus constituting a Body that is partly gummosus, and, as such, tenacious, soluble in Water, partly resinous, and therefore friable, and soluble in Oil, or Spirit of Wine, but not in Water.

Botanists are now generally agreed, that all Plants are furnished with Organs and Parts necessary both for Chylification and Sanguification, that they have Veins, Arteries, Heart, Lungs, adipole Cellules, &c. If so, it is obvious that there must be some Difference between the Juices, which have not undergone the Action of those Parts, and such as have already circulated a Number of Times.

The several Juices hitherto recounted are the first or nutritious Juice, called also the Chyle of the Plant, under such Alterations and new Modifications, as it undergoes in being received, and kept some Time, in Parts of a peculiar Structure, as Leaves, Flower, Seed, &c. This last Juice, called the Blood, is the same nutritious Juice farther altered, by being divers Times passed through each of those Parts, and remixed, and at length converted into a new Juice, with Properties different from any of them all.

To prove the Circulation of the Sap, Instances are brought from Experiments made by Mr. Fairchild, as his budding and inoculating of a Passion Tree, whose Leaves are spotted with yellow, into one of that Sort of Passion Tree whose Leaves are plain, for though the Buds did not take, yet after it had been budded a Fortnight, the yellow Spots began to shew themselves about three Feet above the Inoculation, and in a little Time after that, the yellow Spots appeared on a Shoot, which came out of the Ground from another Part of the Plant, which has been accounted a plain Proof of the Sap's Circulation.

Another Instance is, another Experiment of the same Person, who grafted the ever-green Oak, or Ilex, upon the common Oak. The Leaves of the common Oak, which was the Stock, decayed, and fell off at the usual Season of the Year, but the ever-green Oak, which was the Cyon grafted upon it, held its Leaves, and continued shooting in the Winter, from whence it is concluded, that when Trees drop their Leaves, the Sap,

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keeps full in Motion, and is not gone into the Root, as some Persons think.

There are also other Experiments of the same Person, which were shewn before the Royal Society, as the *New-England Cedar*, or rather Juniper, grafted on the *Virginian*, and what is taken to prove the Circulation in it, is, the Branch which was grafted was left several Inches below the Grafting, which continued growing as well as the upper Part above the Grafting.

And also another, which is the *Viburnum*, with the Top planted in the Ground, which was become Roots, and the Roots turned up, which were become Branches; which Plant was in as good a State of growing, as it was in its natural State.

A third Experiment of his was on a Pear Tree, which he inarched upon two Pear Stocks in *March* 1721-2, having the Roots out of the Ground, and was in a good flourishing State, with a Branch in Blossom, that receives no other Nourishment but by the Juices that return down the other two Branches, which, though it had been done above two Years, continued shooting Suckers out of the Root, which is esteemed as a Proof, that the Branches are as useful to support the Roots, as the Roots the Branches, and thence he infers, that it is not strange that so many Trees miscarry in planting, when there are no Branches left to the Head to maintain the Circulation to the Roots.

A fourth Experiment he made on the Cedar of *Lebanon*, grafted on the *Larix*, which drops its Leaves in the Winter, yet maintained the Cedar in a flourishing Condition as if it had been on a Tree which held its Leaves all the Winter, and the Circulation of Juices supported the Graft below the Grafting, and kept it in as good Health as above the Grafting.

In Opposition to the Notion of the Circulation of the Sap in Trees like to that in animal Bodies, the Rev. Dr. *Hales*, in his excellent Treatise on *Vegetable Statics*, presents us with various Experiments, and says,

When the Sap has first passed through that thick and fine Strainer, the Bark of the Root, we then find it in greatest Quantities in the most lax Part between the Bark and Wood, and that the same through the whole Tree.

And if in the early Spring, the Oak, and several other Trees, were to be examined near the Top and Bottom, when the Sap first begins to move, so as to make the Bark run, and easily peel off, he believes it would be found, that the lower Bark is first moistened, whereas the Bark of the Top Branches ough first to be moistened, if the Sap descends by the Bark. As to the Vine, he says, he is pretty well assured, that the lower Bark is first moistened.

He adds, That it is to be seen in many of the Examples of the Experiments he has given in that Book, what Quantities of Moisture Trees daily imbibe and perspire; now the Celerity of the Sap must be very great, if that Quantity of Moisture must most of it ascend to the Top of the Tree, then descend, and ascend again, before it is carried off by Perspiration.

The Defect of a Circulation in Vegetables seems, in some Measure, to be supplied by the much greater Quantity of Liquor, which the Vegetable takes in, than the Animal, whereby its Motion is accelerated, for,

for, by the first Example he gives, we find the Sunflower, Bulk for Bulk, imbibes and perspires seventeen Times more fresh Liquor than a Man every twenty-four Hours.

Besides, Nature's great Aim in Vegetables being only that the vegetable Life be carried on and maintained, there was no Occasion to give its Sap the rapid Motion which was necessary for the Blood of Animals.

In Animals it is the Heart which sets the Blood in Motion, and makes it continually circulate, but in Vegetables we can discover no other Cause of the Sap's Motion, but the strong Attraction of the capillary Sap Vessels, assisted by the brisk Undulation and Vibrations caused by the Sun's Warmth, whereby the Sap is carried up to the Top of the tallest Trees, and is there perspired off through the Leaves, but, when the Surface of the Tree is greatly diminished by the Loss of its Leaves, then also the Perspiration and Motion of the Sap is proportionably diminished, as is plain from many of his Experiments.

So that the ascending Velocity of the Sap is principally accelerated by the plentiful Perspiration of the Leaves, thereby making Room for the fine capillary Vessels to exert their vastly attracting Power; which Perspiration is effected by the brisk rarefying Vibrations of Warmth, a Power that does not seem to be any Ways well adapted to make the Sap descend from the Tops of Vegetables, by different Vessels, to the Root.

If the Sap circulated, it must needs have been seen descending from the upper Part of large Gashes cut in Branches set in Water, and with Columns of Water pressing on their Bottoms in long Glass Tubes, in his 43d and 44th Experiment.

In both which Cases it is certain that great Quantities of Water passed through the Stem, so that it must needs have been seen descending, if the Return of the Sap downward were by Trusion or Pulsion, whereby the Blood in Animals is returned through the Veins to the Heart, and that Pulsion, if there were any, must necessarily be exerted with prodigious Force to be able to drive the Sap through the finer Capillaries.

So that if there be a Return of the Sap downward, it must be by Attraction, and that a very powerful one, as may be seen by many of these Experiments, and particularly by Experiment the 11th. But it is hard to conceive what and where that Power is, which can be equivalent to that Provision Nature has made for the Ascent of the Sap, in Consequence of the great Perspiration of the Leaves.

The Instances of the Jasmine Tree, and of the Passion Tree, have been looked upon as Proofs of the Circulation of the Sap, because their Branches, which were far below the inoculated Bud, were gilded. But we have many visible Proofs in the Vine, and other bleeding Trees, of the Sap's receding back, and pushing forward alternately, at different Times of the Day and Night, and there is great Reason to think that the Sap of all other Trees has such an alternate Receding and progressive Motion occasioned by the Alternacies of Day and Night, warm and cold, moist and dry.

For the Sap in all Vegetables does probably recede, in some Measure, from the Tops of Branches, as the Sun leaves them, because its rarefying Power then cea-

sing, the greatly rarefied Sap and Air mixed with it will condense, and take up less Room than they did, and the Dew and Rain will then be strongly imbibed by the Leaves, as is probable from Experiment 42, and several others, whereby the Body and Branches of the Vegetable, which have been much exhausted by the great Evaporation of the Day, may, at Night, imbibe Sap and Dew from the Leaves.

For, by several Experiments in the 1st Chapter of the aforesaid Book of Vegetable Statics, Plants were found to increase considerably in Weight in dewy and moist Nights.

And by other Experiments on the Vine, in the 3d Chapter, it was found that the Trunk and Branches of Vines were always in an imbibing State caused by the great Perspiration of the Leaves, except in the bleeding Season; but, when at Night that perspiring Power ceases, then the contrary imbibing Power will prevail, and draw the Sap and Dew from the Leaves, as well as Moisture from the Roots.

And we have a further Proof of this in Experiment 12, where, by fixing mercurial Gauges to the Stems of several Trees which do not bleed, it is found that they are always in a strongly imbibing State, by drawing up the Mercury several Inches, whence it is easy to conceive how some of the Particles of the gilded Bud in the inoculated Jasmine may be absorbed by it, and thereby communicate their gilding *Miasma* to the Sap of the Branches, especially when, some Months after the Inoculation, the Stock of the inoculated Jasmine is cut off a little above the Bud, whereby the Stock, which was the counter-acting Part to the Stem, being taken away, the Stem attracts more vigorously from the Bud.

Another Argument for the Circulation of the Sap is, that some Sorts of Grafts will infect and canker the Stocks they are grafted on, but by Experiment 12 and 37, where mercurial Gauges were fixed to fresh-cut Stems of Trees, it is evident that those Stems were in a strongly imbibing State, and consequently the cankered Stocks might very likely draw Sap from the Graft, as well as the Graft alternately from the Stock, just in the same Manner as Leaves and Branches do from each other in the Vicissitudes of Day and Night.

And this imbibing Power of the Stock is so great, where only some of the Branches of the Stock will, by their strong Attraction, starve those Grafts, for which Reason it is usual to cut off the greatest Part of the Branches of the Stock, leaving only a few small ones to draw up the Sap.

The Instance of the Ilex grafted upon the English Oak seems to afford a very considerable Argument against a Circulation, for if there were a free uniform Circulation of the Sap through the Oak and Ilex, why should the Leaves of the Oak fall off in Winter, and not those of the Ilex?

Another Argument against an uniform Circulation of the Sap in Trees, as in Animals, may be drawn from Dr. Hales 37th Experiment, viz. where it was found, by the three mercurial Gauges fixed to the same Vine, that while some of its Branches changed their State of protruding Sap into a State of imbibing, others

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continued protruding Sap, one nine, and the other thirteen Days longer.

That the Sap does not descend between the Bark and the Wood, as the Favourers of a Circulation suppose, seems evident from hence, viz. That if the Bark be taken off for three or four Inches Breadth quite round, the Bleeding of the Tree above that bared Place will much abate, which ought to have the contrary Effect, by intercepting the Course of the refluent Sap, if the Sap descended by the Bark.

But the Reason of the Abatement of the Bleeding in this Case may be well accounted for, from the manifest Proof we have in these Experiments, that the Sap is strongly attracted upward by the vigorous Operation of the perspiring Leaves, and attracting Capillaries; but, when the Bark is cut off for some Breadth below the bleeding Place, then the Sap which is between the Bark and the Wood below that disbarked Place is deprived of the strong attracting Power of the Leaves, &c. and consequently the bleeding Wound cannot be supplied so fast with Sap, as it was before the Bark was taken off.

But the most considerable Objection against this progressive Motion of the Sap, without a Circulation, arises from hence, viz. That it is too precipitate a Course for a due Digestion of the Sap, in order to Nutrition, whereas in Animals Nature has provided that many Parts of the Blood shall run a long Course before they are either applied to Nutrition, or discharged from the Animal.

But when we consider that the great Work of Nutrition in Vegetables, as well as Animals (I mean, after the Nutrient is got into the Veins and Arteries of Animals), is chiefly carried on in the fine capillary Vessels, where Nature selects and combines, as shall best suit her different Purposes, the several mutually attracting nutritious Particles, which were hitherto kept disjointed by the Motion of their fluid Vehicle. We shall find that Nature has made abundant Provision for this Work in the Structure of Vegetables, all whose Composition is made up of nothing else but innumerable fine capillary Vessels, and glandulous Portions or Vessels.

Upon the Whole he thinks we have, from these Experiments and Observations, sufficient Ground to believe, that there is no Circulation of the Sap in Vegetables, notwithstanding many ingenious Persons have been induced to think there was from several curious Observations and Experiments, which evidently prove that the Sap does in some Measure recede from the Top toward the lower Part of Plants, whence they were, with good Probability of Reason, induced to think that the Sap circulated.

SAPINDUS. Tourn. Inst. R. H. 659. Tab. 440. Lin. Gen. Pl. 448. The Sopeberry Tree.

The Characters are,

The Empalement of the Flower is composed of 4 plain, oval, coloured Leaves which spread open and fall away. The Flower has 4 oval Petals which are less than the Empalement; it has 8 Stamina the Length of the Petals, terminated by erect Summits, and an oval Germen with 3 or 4 Lobes, supporting a short Style, crowned by a single Stigma. The Germen becomes one, two or three globular Berries including Nuts of the same Form. There

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is rarely above one of these pregnant, the others are abortive.

The Species are,

1. SAPINDUS foliis pinnatis. Lin. Sp. Pl. 367. Sopeberry Tree with winged Leaves. *Sapindus foliis costæ alatæ innascentibus*. Tourn. App. 659. Sopeberry Tree with Leaves growing from the Wings of the Mid-rib.

2. SAPINDUS foliis quaterno-pinnatis rigidis acutis. Sopeberry Tree with winged Leaves composed of 4 stiff acute-pointed Lobes.

The first Sort grows naturally in the Islands of the West-Indies, where it rises with a woody Stalk from 20 to 30 Feet high, sending out many Branches toward the Top, garnished with winged Leaves, composed of 3, 4 or 5, Pair of Spear-shaped Lobes from 3 to 4 Inches long, and an Inch and a Quarter broad in the Middle, drawing to Points at both Ends. The Mid-rib has a membranaceous or leafy Border running on each Side from one Pair of Lobes to the other, which is broadest in the Middle between the Lobes; they are of a pale green Colour, and pretty stiff; the Flowers are produced in loose Spikes at the End of the Branches; they are small and white, so make no great Appearance. These are succeeded by oval Berries as large as middling Cherries, sometimes single, at others two, three, or four are joined together; these have a saponaceous Skin or Cover which incloses a very smooth roundish Nut of the same Form, and of a shining black when ripe. These Nuts were formerly brought to England for Buttons to Waistcoats, some were tipped with Silver, and others with different Metals; they were very durable, as they did not wear, and seldom broke. The Skin or Pulp, which surrounds the Nuts, is used in America to wash Linen, but it is very apt to burn and destroy it, if often used, being of a very acid Nature.

The 2d Sort was discovered by the late Dr. Housfoun growing naturally at La Vera Cruz in New Spain; this hath a strong woody Stalk, which rises about 20 Feet high, sending out many short strong ligneous Branches covered with a smooth gray Bark, and garnished with winged Leaves, composed of 2 Pair of Spear-shaped Lobes very stiff and smooth; the inner Pair are small, being seldom more than an Inch and a Half long, and half an Inch broad in the Middle; the two outer Lobes are near 3 Inches long, and almost an Inch broad in the Middle, drawing to Points at both Ends; they are oblique to the Foot Stalk, the Mid-rib running much nearer to the Border on one Side; they are of a pale green, and sit close to the Mid-rib, which has no Border or Wing like the other. The End of the Branches are divided into 2 or 3 Foot Stalks, each sustaining a loose Spike of Flowers like those of the other Sort; these are succeeded by roundish Berries like those of the former, but there are generally two, three, or four of them joined together.

These Plants are propagated by Seeds (which must be obtained from the Countries where they naturally grow, for they do not produce Fruit in Europe); these must be put into small Pots filled with rich fresh Earth, and plunged into a hot Bed of Tanners Bark. The

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Pots must be frequently watered, otherwise the Berries, whose outer Cover is very hard, will not vegetate. In five or six Weeks the Plants will appear, when the Glasses of the hot Bed should be raised every Day in warm Weather to admit fresh Air to them. In three Weeks or a Month after the Plants appear, they will be fit to transplant, when they must be shaken out of the Pots, and carefully parted, so as not to injure their Roots, and each planted into a separate small Pot filled with light rich Earth, and then plunged into the hot Bed again, observing to shade them from the Sun every Day, until they have taken new Root after which Time they must have free Air admitted to them every Day when the Weather is warm, and be frequently watered.

After the Plants are well rooted, they will make great Progress so as to fill the Pots with their Roots in a few Weeks Time, they must then be shifted into larger Pots, and as they advance, should be inured to bear the open Air by Degrees; for if they are forced too much in Summer, they seldom live through the Winter. I have frequently raised these Plants from Seeds to the Height of 2 Feet in one Summer, and their Leaves have been a Foot and a Half in Length, so that they made a fine Appearance; but these Plants did not survive the Winter, whereas those, which were exposed to the open Air in July, and thereby stunted in their Growth, continued their Leaves fresh all the Winter. These were placed in a Stove upon Shelves, where the Warmth was very moderate, with which these Plants will thrive better than in a greater Heat.

SAPONARIA. *Lin. Gen. Pl.* 449. *Lycnris. Tourn. Inst. R. H.* 333. *Tab* 175. Sopewort.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, which is cut into 5 Points. It has 5 Petals whose Tails are narrow, angular, and the Length of the Empalement; their Borders are broad, obtuse, and plain. It has 10 Awl-shaped Stamina, the Length of the Tube of the Flower, which are alternately inserted into the Petals, and terminated by obtuse prostrate Summits, and a taper Germen supporting 2 erect parallel Styles crowned by acute Stigmas. The Germen becomes a close Capsule the Length of the Empalement, having one Cell filled with small Seeds.

The Species are,

1. SAPONARIA *calycibus cylindricis, foliis ovato-lanceolatis. Hort. Cliff.* 165. Sopewort with cylindrical Empalements, and oval Spear shaped Leaves. *Lycnris silvestris quæ saponaria vulgò. Tourn. Inst.* 336. Wild Campion, vulgarly called Sopewort.

2. SAPONARIA *calycibus cylindricis, foliis ovatis nervosis semiamplexicaulis.* Sopewort with cylindrical Empalements, and oval veined Leaves, half embracing the Stalks. *Lycnris saponaria dicta, folio convoluta. Raii. Syn.* 339. Campion, called Sopewort, with a twisted Leaf.

3. SAPONARIA *calycibus pyramidatis quinquangulibus, foliis oblongo-ovatis acuminatis.* Sopewort with pyramidal five cornered Empalements, and oblong, oval, acute-pointed Leaves. *Lycnris segetum rubra, foliis persiliatæ C. B. P.* 204. Red Corn Campion, with thorough Wax Leaves.

4. SAPONARIA *calycibus pyramidatis quinquangulibus, foliis ovato-lanceolatis, semiamplexicaulis.* Sopewort with pyramidal 5-cornered Empalements, and oval Spear-shaped Leaves, half embracing the Stalks. *Lycnris segetum rubra, foliis persiliatæ amplioribus Juss.* Red Corn Campion, with larger thorough Wax Leaves.

5. SAPONARIA *calycibus cylindricis villosis, caule dichotomo erecto patulo. Hort. Upsal.* 106. Sopewort with cylindrical hairy Empalements, and erect spreading Stalks divided by Pairs. *Lycnris Orientalis annua supina, antirrini folio, flore minimo purpurascens. Tourn. Cor.* 25. Low annual Eastern Sopewort, with a Snap dragon Leaf and the least purplish Flower.

The first Sort is the common Sopewort of the Shops; this grows naturally in many Parts of England, and is rarely admitted into Gardens; it has a creeping Root which spreads far on every Side, so as in a short Time to fill a large Space of Ground, from which arise many purplish Stalks about a Foot and a Half high, which are jointed and garnished with opposite Leaves at each; these are oval, Spear-shaped, and smooth, about three Inches long, and an Inch and a Half broad, ending in Points; they have three longitudinal Veins on their under Side, and are of a pale green. The Foot Stalks of the Flowers arise from the Wings of the Leaves opposite, they sustain 4, 5, or more purple Flowers each, which have generally two small Leaves placed under them. The Stalk is also terminated by a loose Bunch of Flowers growing in Form of an Umbel, they have each a large swelling cylindrical Empalement, and five broad obtuse Petals which spread open, and are of a purple Colour. These appear in July, and are succeeded by oval Capsules with one Cell, filled with small Seeds.

The Leaves of this Plant are sometimes used in Medicine, they are accounted opening and attenuating, and somewhat sudorifick. The Decoction of this Plant is used to cleanse and scower woollen Cloths: The poor People in some Countries use it instead of Sope for washing, from whence it had its Title.

There is a Variety of this with double Flowers, which is preserved in Gardens, but the Roots are very apt to spread far on every Side, if they are not confined, so these Plants should not be placed in Borders among better Flowers; but as the Flowers continue in Succession from July to the Middle of September, so a few of the Plants may be allowed a Place in some abject Part of the Garden, for they will thrive in any Situation, and propagate fast enough by their creeping Roots.

The 2d Sort was found growing in a Wood near Liebbarrow in Northamptonshire, by Mr. Gerrard. It has been generally esteemed a *Lusus Nature*, and not a distinct Species, but I have never found it alter in 40 Years; but as it doth not produce Seeds, so there is no Certainty of its being a distinct Species. The Roots of this do not spread like those of the first, the Stalks are shorter, thicker, and do not grow so erect; they rise a Foot, the Joints are very near and swelling; the Leaves are produced singly on the lower Part of their Stalks, but toward the Top they are often placed by Pairs; they are oval-shaped, about 3 Inches long and two broad, having several longitudinal Veins or Plaits, and

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are hollowed like a Ladle. The Flowers are disposed loosely on the Top of the Stalk, they have large cylindrical Empalements; they are of one Petal, and scarce any visible Stamina; they are of a purple Colour, and flower in July. This Plant is preserved for the Sake of Variety in some Gardens, but as there is little Beauty in the Flowers, it does not merit a Place in Gardens for Pleasure. It is easily propagated by parting the Roots in Autumn, and loves a moist shady Situation.

The 3d Sort is an annual Plant, which grows naturally among Corn in the South of France and Italy. This rises with an upright Stalk near a Foot and a Half high, branching out upward into several Divisions; these always are by Pairs opposite, as are also the Leaves, which are about an Inch and a Half long, and half an Inch broad at their Base, ending in acute Points; they sit close to the Stalks, are smooth, and of a gray Colour. The Flowers are produced at the End of the Branches, each standing upon a long naked Foot Stalk; their Empalements are large, swelling, and pyramidal, having 5 acute Corners or Angles; the Petals are but small; they have long Necks or Tails, which are narrow; their upper Part is obtuse, and of a reddish purple Colour. These appear in June and July, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in Spain; this is also an annual Plant; it rises with a strong smooth Stalk about 2 Feet high, garnished with oval Spear-shaped Leaves 3 Inches long, and an Inch and a Half broad near their Base, drawing to a Point at the End; they are fleshy, of a gray Colour, and are very smooth; these are placed by Pairs, and half embrace the Stalks with their Base; the upper Part of the Stalk divides into many Branches, which are again subdivided into long naked Foot Stalks, each sustaining a single Flower; the Empalement of the Flower is large, pyramidal, and swelling, having 5 acute Angles. The Flowers are composed of five obtuse red Petals, which spread open flat above the Empalement. These appear in June and July, and the Seeds ripen in Autumn.

The 5th Sort grows naturally in the Levant, from whence Dr. Tournefort sent the Seeds. This is a low annual Plant, seldom rising more than 4 Inches high, but divides into Branches by Pairs from the Bottom, which spread asunder. The Leaves are very small, the Flowers come out single from the Wings of the Leaves; they have hairy cylindrical Empalements, out of which the Petals of the Flowers do but just peep, so are not obvious at any Distance. The whole Plant is very clammy to the Touch. As this Plant makes no Figure, so it is only kept for Variety.

These Plants are easily propagated by Seeds, which should be sown where the Plants are to remain, and will require no other Care but to keep them clean from Weeds, and thin them where they are too close. If the Seeds are sown in Autumn, or are permitted to scatter, the Plants will come up without Care.

SAPOTA. Plum. Nov. Gen. 43. Tab. 4. Acras. Lin. Gen. Pl. 1093. The Mammee Sapota.

The Characters are,

The Flower has a permanent Empalement composed of 5 oval Leaves, which are acute-pointed and erect. It has 5 roundish Heart-shaped Petals, connected at their Base

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ending in acute Points; and 5 short Stamina the Length of the Tube, terminated by Arrow-pointed Summits, with an oval Germen, supporting a short Style crowned by an obtuse Stigma. The Germen becomes an oval succulent Fruit, inclosing one or two oval hard Nuts or Stones.

The Species are,

1. SAPOTA foliis oblongo-ovatis, fructibus turbinatis glabris. Sapota with oblong oval Leaves, and smooth turbinated Fruit. *Sapota fructu turbinato minori.* Plum. Nov. Gen. 43. Sapota with a smaller turbinated Fruit.

2. SAPOTA foliis lanceolatis, fructu maximo ovato, seminibus ovatis utrinque acutis. Sapota with Spear-shaped Leaves, a very large oval Fruit, and oval Seeds pointed at both Ends.

Sapota is what these Fruit are called by the Natives of America, to which some add the Appellation of Mammee; but there is no other Name given to these Fruits by the English, since they have settled in the West-Indies, so far as I can learn.

The 1st of these Trees is common about Panama, and some other Places in the Spanish West-Indies, but is not to be found in any of the English Settlements in America. The second Sort is very common in Jamaica, Barbadoes, and most of the Islands in the West-Indies, where the Trees are planted in Gardens for their Fruit, which is by many Persons greatly esteemed.

The 2d Sort grows in America to the Height of 35 or 40 Feet, having a strait Trunk, covered with an Ash-coloured Bark. The Branches are produced on every Side, so as to form a regular Head; these are beset with Leaves, a Foot in Length, and near three Inches broad in the Middle, drawing to a Point at each End. The Flowers which are produced from the Branches, are of a Cream Colour; when these fall away, they are succeeded by large oval or Top-shaped Fruit, covered with a brownish Skin, under which is a thick Pulp of a Russet Colour, very luscious, called Natural Marmalade, from its Likeness to Marmalade of Quinces.

As these Trees are Natives of very warm Countries, they cannot be preserved in England, unless in the warmest Stoves and managed with great Care. They are propagated by planting the Stones, but as these will not keep good long out of the Ground, the surest Method to obtain these Plants is, to have the Stones planted in Tubs of Earth, as soon as they are taken out of the Fruit, and the Tubs placed in a Situation where they may have the Morning Sun, and kept duly watered. When the Plants come up, they must be secured from the Vermin and kept clear from Weeds, but should remain in the Country till they are about a Foot high, when they may be shipped for England; but they should be brought over in the Summer Season, and, if possible, Time enough for the Plants to make good Roots after they arrive. During their Passage they must have some Water, while they continue in a warm Climate; but as they come into colder Weather, they should have very little Moisture; and they must be secured from Salt Water, which will soon destroy the Plants if it gets at them.

When these Plants arrive in England, they should be carefully taken out of the Tubs, preserving some Earth to their Roots, and planted into Pots filled with fresh Earth,

Earth, and then plunged into a moderate hot Bed of Tanners Bark, observing, if the Weather is hot, to shade the Glasses with Mats every Day, to screen the Plants from the Sun, until they have taken new Root; observing also, not to water them too much at first, especially if the Earth in which they come over is moist; because too much Water is very injurious to them before they are well rooted, but afterward they must be frequently refreshed with Water in warm Weather; and they must have a large Share of Air admitted to them, otherwise their Leaves will be infested with Insects, and become foul; in which Case they must be washed with a Sponge to clean them, without which the Plants will not thrive.

In the Winter these Plants must be placed in the warmest Stove, and in cold Weather they should have but little Water given to them, though they must be frequently refreshed when the Earth is dry; especially if they retain their Leaves all the Winter, they will require a greater Share of Water, than when they drop their Leaves; so that this must be done with Discretion, according to the State in which the Plants are. As these Plants grow in Magnitude, they should be shifted into Pots of a larger Size, but they must not be over potted, for that will infallibly destroy them.

SARRACENA. *Tourn. Inst. R. H.* 657. *Tab.* 476. *Lin. Gen. Pl.* 578. The Sidefaddle Flower.

The Characters are,

The Flower has a double Empalement; the under is composed of 3 small oval Leaves, which fall away; the upper has 5 large coloured Leaves, which are permanent. It has 5 oval inflexed Petals which inclose the Stamina, whose Tails are oblong, oval, and erect, and a great Number of small Stamina, terminated by Target-shaped Summits. In the Center is situated a roundish Germen, supporting a short cylindrical Style, crowned by a Target-shaped, five-cornered Stigma covering the Stamina, and is permanent. The Germen becomes a roundish Capsule with five Cells, filled with small Seeds.

The Species are,

1. SARRACENA *foliis gibbis*. *Hort. Cliff.* 427. *Sarracena* with gibbous Leaves. *Sarracena Canadensis, foliis cavis & auritis*. *Tourn. Inst.* 657. *Sarracena* of Canada, with hollow and eared Leaves.

2. SARRACENA *foliis striatis*. *Lin. Sp. Pl.* 510. *Sarracena* with closed Leaves. This is the *Sarracena foliis longioribus & angustioribus*. *Catech. Car.* 2. p. 69. *Sarracena* with longer and narrower Leaves.

The 1st Sort grows naturally upon Bogs in moist Parts of North America; this hath a strong fibrous Root, which strikes deep into the soft Earth, from which arise 5, 6, or 7 Leaves, in Proportion to the Strength of the Plant; these are about 5 Inches long; they are hollow like a Pitcher, narrow at their Base, but swell out large at the Top; their outer Sides are rounded, but on their inner Side they are a little compressed, and have a broad leafy Border running longitudinally the whole Length of the Tube; and to the rounded Part of the Leaf there is on the Top a large Appendage or Ear standing erect, of a brownish Colour; this surrounds the Outside of the Leaves about two Thirds of the Top, it is eared at both Ends, and

waved round the Border. From the Center of the Root, between the Leaves, arises a strong, round, naked Foot Stalk about a Foot high, sustaining one nodding Flower at the Top, which has a double Empalement; the outer one is of one Leaf, divided into 5 Parts to the Bottom, where they are connected to the Foot Stalks; these Segments are obtuse and bend over the Flower, so as to cover the Inside of it; they are of a purple Colour on the Outside, but green within, having purple Edges; the inner Empalement which is composed of three green Leaves, falls off; within these are 5 oval Petals of a purple Colour, which are hollowed like a Spoon; these cover the Stamina and Summits, with Part of the Stigma also. In the Center is situated a large, roundish, channelled Germen, supporting a short Style, crowned by a very broad five-cornered Stigma, fastened in the Middle to the Style, and covering the Stamina like a Target; this is green, and the 5 Corners which are stretched out beyond the Brim are each cut into 2 Points, and are purplish. Round the Germen are situated a great Number of short Stamina, joining the Sides of the Germen closely, and terminated by Target-shaped, furrowed Summits, of a pale Sulphur Colour. When the Flower decays, the Germen swells to a large roundish Capsule with 5 Cells, covered by the permanent Stigma, and filled with small Seeds. It flowers in June, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in Carolina; on Bogs and in standing shallow Waters. The Leaves grow near 3 Feet high, being small at the Bottom, but widening gradually to the Top. These are hollow, and arched over at the Mouth like a Friar's Cowl. The Flowers grow on naked Pedicles, rising from the Root to the Height of 3 Feet and are green.

These Plants are esteemed for the singular Structure of their Leaves and Flowers, which are so different from all the known Plants, as to have little Resemblance of any yet discovered, but there is some Difficulty in getting them to thrive in England, when they are obtained from Abroad; for as they grow naturally on Bogs, or in shallow standing Waters, unless they are constantly kept in Wet, they will not thrive; and although the Winters are very sharp in the Countries where the first Sort naturally grows, yet being covered with Water, and the Remains of decayed Plants, they are defended from Frost.

The best Method to obtain these Plants is, to procure them from the Places of their natural Growth, and to have them taken up with large Balls of Earth to their Roots, and planted in Tubs of Earth; which must be constantly watered during their Passage, otherwise they will decay before they arrive; for there is little Probability of raising these Plants from Seeds, so as to produce Flowers in many Years, if the Seeds do grow; so that young Plants should be taken up to bring over, which are more likely to stand here, than those which have flowered two or three Times. When they are brought over, they should be planted into pretty large Pots, filled with soft spongy Earth, mixed with rotten Wood, Moss, and Turf, which is very like the natural Soil in which they grow. These Pots should be put into Tubs or large Pans which will hold Water, with

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with which they must be constantly supplied, and placed in a shady Situation in Summer; but in Winter they must be covered with Moss, or sheltered under a Frame, otherwise they will not live in this Country; for as they must be kept in Pots, so if these are exposed to the Frost, it will soon penetrate through them, and greatly injure, if not destroy the Plants; but when they are placed under a common Frame, where they may have the open Air in mild Weather, and be sheltered from hard Frost, they will thrive and flower very well.

SASSAFRAS. See Laurus.

SATUREJA. Tourn. Inst. R. H. 197. *Thymbra*. Tourn. Inst. 197. Lin. Gen. Pl. 626. Savory; in French, *Sarriete*.

The Characters are,

The Flower hath an erect, tubulous, striated, permanent Empalement of one Leaf indented at the Brim in 5 Points; it hath 1 ringent Petal, whose Tube is cylindrical and shorter than the Empalement; the Chaps are single, the upper Lip erect and obtuse, having an acute Indenture at the Point. The under Lip is spreading, divided into 3 Parts, nearly equal. It has 4 bristly Stamina, 2 of which are almost the Length of the upper Lip, the other 2 shorter; they are terminated by Summits which touch each other, and a four pointed Germen supporting a bristly Style, crowned by 2 bristly Stigmas. The Germen afterwards becomes 4 Seeds, which ripen in the Empalement.

The Species are,

1. SATUREJA *pedunculis bifloris*. Vir. Cliff. 87. Savory with two Flowers upon each Foot Stalk, *Satureja sativa*. J. B. 3. 272. Garden or Summer Savory.

2. SATUREJA *floribus verticillatis, foliis ovatis acutis*. Flor. Leyd. Prod. 324. Savory with whorled Flowers, and oval acute-pointed Leaves. *Thymbra legitima*. Clus. Hist. 1. p. 358. The true *Thymbra*.

3. SATUREJA *pedunculis dichotomis lateralibus solitariis, foliis mucronatis*. Lin. Sp. Pl. 568. Savory with single diverging Foot Stalks on the Sides of the Branches, and sharp-pointed Leaves. *Satureja montana*. C. B. P. 218. Mountain or Winter Savory.

4. SATUREJA *capitulis terminalibus, foliis lanceolatis*. Lin. Sp. Pl. 567. Savory with Heads of Flowers terminating the Stalks, and Spear-shaped Leaves. *Clinopodium pulegii angusto rigidoque folio, Virginianum, flosculis in cymis dispositis*. Pluk. Alm. 110. Tab. 54. fig. 2. Virginian Field Basil with a stiff narrow Pennyroyal Leaf, and Flowers disposed on the Tops of the Stalks.

5. SATUREJA *foliis ovatis serratis, corymbis terminalibus dichotomis*. Lin. Sp. Pl. 568. Savory with oval sawed Leaves, and Flowers growing in a divided Corymbus, terminating the Stalks. *Calamintha erecta, Virginiana, mucronato folio glabro*. Mor. Hist. 3. p. 413. Upright Virginian Field Basil, with a smooth acute-pointed Leaf.

6. SATUREJA *verticillis lanuginosis, dentibus calycinis setaceis pilosis*. Hort. Cliff. 306. Savory with woolly Whorls of Flowers, whose Indentures of their Empalements are bristly and hairy. *Thymbra Hispanica majoranae folio*. Tourn. Inst. R. H. 197. Greater Spanish *Thymbra* with a Marjoram Leaf, commonly called Mastick Thyme.

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7. SATUREJA *verticillis fastigiatis concatenatis, foliis lineari-lanceolatis*. Lin. Sp. Pl. 567. Savory with bunched Whorls of Flowers, and linear Spear-shaped Leaves. *Thymbra sancti Juliani sive satureja verior*. Lob. Icon. 425. St. Julian's *Thymbra*, or the true Savory.

8. SATUREJA *pedunculis corymbosis lateralibus geminis, bracteis calyce brevioribus*. Lin. Sp. Pl. 568. Savory with Corymbuses of Flowers upon Foot Stalks, growing by Pairs from the Wings of the Leaves, and Bractees shorter than the Empalements. *Clinopodium Creticum*. Alp. Exot. 265. Cretan Field Basil.

9. SATUREJA *floribus spicatis, foliis carinatis punctatis ciliatis*. Lin. Mat. Med. 283. Savory with spiked Flowers, and Keel-shaped hairy Leaves having Spots. *Thymum legitimum*. Clus. Hist. 1. p. 375. The legitimate Thyme.

The 1st Sort is generally known in the Gardens by the Title of Summer Savory. This is an annual Plant, which grows naturally in the South of France and in Italy, but is cultivated in the English Gardens, for the Kitchen and medicinal Use. It rises with slender erect Stalks about a Foot high, sending out Branches at each Joint by Pairs, garnished with Leaves placed by Pairs, about an Inch long, and one Eighth of an Inch broad in the Middle; they are stiff, a little hairy, and have an aromack Odour if rubbed. The Flowers grow from the Wings of the Leaves toward the upper Part of the Branches, each Foot Stalk sustaining 2 Flowers, of the Lip Kind, having a short cylindrical Tube; the upper Lip is erect and indented at the Point, the lower is divided into 3 almost equal Parts; they are of a pale Flesh Colour and appear in July, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in Crete; this rises with a shrubby Stalk about 2 Feet high, dividing into several slender ligneous Branches, garnished with small stiff oval Leaves ending in acute Points, which emit an aromack Odour when bruised. The Flowers grow in thick Whorls round the Stalks toward the Top, they have short, hairy, five-pointed Empalements; the Tube of the Petal is longer than the Cup, and the Flower is shaped like that of the former, but larger and of a brighter red Colour. This Plant flowers in June, July, and August, but rarely ripens its Seeds in England.

The 3d Sort is well known in the Gardens by the Title of Winter Savory; this is a perennial Plant, which grows naturally in the South of France and Italy, but is here cultivated in Gardens both for Food and Physick. This hath a shrubby low branching Stalk; the Branches rise about a Foot high, they are ligneous, and garnished with 2 very narrow Leaves about an Inch long at each Joint; they are stiff, and stand opposite; from the Base of these come out a few small Leaves in Clusters. The Flowers grow from the Wings of the Leaves upon short Foot Stalks; they are shaped like those of the first Sort, but are larger and of a paler Colour. These appear in June, and are succeeded by Seeds which ripen in Autumn, but the Plants will continue several Years, especially if planted on a poor dry Soil.

The 4th Sort grows naturally in North America; this hath a perennial Root, but the Stalk is annual, and

and rises about a Foot and a Half high; it is stiff, angular, and branches out toward the Top. The Leaves are stiff, Spear-shaped, and pointed; they are about an Inch and a Half long, and a Quarter of an Inch broad in the Middle, pointed at both Ends, and have a strong Scent of Pennyroyal; the Stalks are terminated by white Flowers, collected into globular Heads. These appear in *July*, but are seldom succeeded by Seeds in *England*.

The 6th Sort grows naturally in *Spain*; this is known in the *English* Gardens by the Title of Herb Mastick, or Mastick Thyme. This hath a shrubby branching Stalk, which rises a Foot and a Half high, covered with a brown Bark; the Branches are slender but ligneous, and garnished with Leaves like those of Thyme, but a little larger. The Flowers grow in roundish Whorls toward the Top of the Branches, which have a Down about them, whereby the Plant is easily distinguished from all the other of this Tribe. The Flowers are small, white, and stand in hairy bristly Empalements; the whole Plant has a very grateful Odour. It flowers in *June*, but does not produce Seeds here.

There is another Variety of this (if not a distinct Species) which has weaker Branches, smaller hairy Leaves, and very small Whorls of Flowers which are hairy, but not woolly like the former. The Seeds of this were sent me from *Spain*, but I have not had Trial enough yet of the Plants, to determine if it is really different from the other.

The 7th Sort grows naturally in *Spain* and some Parts of *Italy*; this hath very slender ligneous Stalks which grow erect, about 9 Inches high, sending out 2 or 3 slender Side Branches toward the Bottom; these are garnished with narrow, Spear-shaped, stiff Leaves, placed opposite. The Flowers grow in Whorls above each other for more than half the Length of the Stalk, they seem as if they were bundled together. The Flowers are small and white, they appear in *July*, but the Seeds seldom ripen here; the whole Plant has a pleasant aromatick Scent.

The 8th Sort grows naturally in *Crete*; this hath very slender ligneous Stalks which rise near a Foot and a Half high, garnished with small, oval, stiff, acute-pointed Leaves, whose Borders are reflexed. The Flowers grow in roundish Whorls upon Foot Stalks, which rise by Pairs from the Wings of the Leaves; these are small and white, they appear in *July*, and if the Season proves warm, the Seeds will ripen in Autumn.

The 9th Sort grows naturally in *Crete*; this has a low shrubby Stalk, which sends out Branches on every Side; these grow about 6 Inches long, and are hoary; they are garnished with stiff, narrow, acute pointed Leaves, hollowed like the Keel of a Boat. The Flowers grow in short roundish Spikes at the End of the Branches, they are small and white; the whole Plant is hoary, and very aromatick. This never produces Seeds in *England*.

The 1st Sort is only cultivated by Seeds; these should be sown the Beginning of *April*, on a Bed of light Earth, either where they are to remain, or for transplanting; if the Plants are to stand unremoved,

the Seeds should be sown thinly; but if they are to be transplanted, they may be sown closer. When the Plants appear they must be kept clean from Weeds, and afterward they may be treated as Marjoram.

The 2d, 7th, and 9th Sorts, are too tender to live through the Winter in the open Air in *England*. These are generally propagated by Slips or Cuttings, which take Root very readily during any of the Summer Months; if these Cuttings or Slips are planted in a shady Border, or shaded from the Sun with Mats, they will put out Roots in two Months fit to be transplanted, when they should be taken up carefully, and each transplanted into a small Pot, filled with fresh undunged Earth, and placed in the Shade till they have taken new Root; then they may be placed in a sheltered Situation, where they may remain till the End of *October*, and then should be placed under a common hot Bed Frame, where they may be exposed to the open Air, when the Weather is mild; but they must be protected from hard Frost, which will destroy them.

As these Plants seldom live above 3 or 4 Years, so there should be a Supply of young Plants raised to preserve the Species, otherwise they may be soon lost. In Winter they should not have much Wet, for they are very subject to grow mouldy by Moisture, but especially if the free Air is excluded from them; or if their Branches are drawn up weak, they are very apt to grow mouldy, especially when the free Air is excluded from them, and then they soon decay.

The 3d Sort is very hardy, so if sown or planted on a dry lean Soil, will endure the greatest Cold of our Winters. I have seen some of the Plants growing on the Top of an old Wall, where they were fully exposed to the Cold, and these survived the severe Frost, when most of those which were growing in the Ground were destroyed. This may be propagated either by Seeds as the first Sort, or Slips, which, if planted in the Spring, will take Root very freely. These Plants will last several Years, but when they are old, their Shoots will be short and not so well furnished with Leaves, so will not be so good for Use as young Plants, therefore it will be proper to raise a Supply of young Plants every other Year.

The 5th Sort has a perennial Root, but the Stalks decay every Autumn. There are two Varieties of this, one of them has narrower Leaves and larger Heads than the other, and the Leaves have very little Scent; whereas those of the common Sort, smell so like Pennyroyal, as not to be distinguished by those who do not see the Plants. This Sort sometimes produces good Seeds here, from which the Plants may be easily propagated; they may also be increased by planting Cuttings in the Spring, as is practised for Mint; these will take Root freely, and if they are afterwards planted in a moist Soil, will thrive exceedingly; but as the Plant is never used here, it is only kept for Variety in some curious Gardens.

The 8th Sort is annual, and so tender as rarely to perfect its Seeds here, so that there is great Difficulty to preserve it. The Cuttings or Slips of this will take Root, by which the Plant may be continued two or three Years; but these must be sheltered in Winter un-

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der a Frame and kept dry, for Wet at that Season will soon destroy them.

SATYRIUM. *Lin. Gen. Pl.* 901. *Orchis. Tourn. Infl.* R. H. 431. *Tab.* 247 & 248.

The Characters are,

It hath a single Stalk; the Flowers have no Empalement, but sit upon the Germen: They have 5 oblong oval Petals, 3 outer and 2 inner, rising and joined in a Helmet; they have a one leaved Nectarium, situated on the Side between the Division of the Petals, fastened to the Receptacle. The upper Lip is short and erect, the under is plain and hangs downward, their Base represents the binder Part of the Scrotum. They have two short slender Stamina fitting upon the Pointal, having oval Summits which have double Cells shut up in the upper Lip of the Nectarium, and an oblong twisted Germen situated under the Flower, having a short Style growing on the upper Lip of the Nectarium, crowned by an obtuse compressed Stigma. The Germen becomes an oblong Capsule with one Cell, having 3 Keels and 3 Cells, opening under the Keels three Ways, and filled with small Seeds.

The Species are,

1. SATYRIUM *bulbis palmatis, foliis linearibus, nectarii labio resupinato trilobo, intermedia majore. Act. Upsal.* 1740. p. 19. Satyrium with handed Bulbs, linear Leaves, and the under Lip of the Nectarium with 3 Lobes, the Middle being the largest. *Orchis palmata angustifolia Alpina, nigro flore. C. B. P.* 86. Narrow-leaved handed Orchis of the Alps with a black Flower.

2. SATYRIUM *bulbis indivisis foliis lanceolatis, nectarii labio trifido, intermedia lineari, obliqua præmorsa. Act. Upsal.* 1740. *Tab.* 18. Satyrium with an undivided Bulb, Spear-shaped Leaves, and the Lip of the Nectarium trifid, the middle Segment being linear and obliquely bitten. *Orchis barbata fætida. J. B. Piff.* 2. p. 756. The Lizard Flower, or great Goatstones.

3. SATYRIUM *bulbis palmatis, foliis oblongis obtusis, nectarii labio lineari trifido, intermedia obsoleta. Act. Upsal.* 1740. p. 18. Satyrium with handed Bulbs, oblong blunt Leaves, and the Lip of the Nectarium divided into three linear Parts, the middle one being obsolete. *Orchis palmata minor, flore luteo viridi. Raii Syn.* 11. 239. Smaller handed Orchis with a green Flower, by some called the Frog Orchis.

4. SATYRIUM *bulbis fasciculatis, foliis lanceolatis, nectarii labio trifido acuto, intermedia majore. Act. Upsal.* 1740. Satyrium with clustered Bulbs. Spear-shaped Leaves, and the Lip of the Nectarium divided into three acute Parts, the middle one being the largest. *Orchis palmata Alpina, spica densa albo-viridi. Haller Helv.* 68. Alpine handed Orchis, with a thick close Spike of whitish green Flowers.

The 1st Sort grows naturally upon the Alps; this has a broad handed bulbous Root, the Stalk rises about 9 Inches high, and is garnished with very narrow Leaves; those on the lower Part are about 4 Inches long; but on the upper they are scarce one Inch; their Base embraces the Stalk. The Flowers grow in a thick short Spike at the Top, they are of a dark purple Colour; the Lip of the Nectarium has 3 Lobes, the middle one being the largest. This flowers the Beginning of June.

The 2d Sort grows naturally in several Parts of

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England; this has a solid bulbous Root, not divided; the Stalk is strong, and rises 15 Inches high; the lower Part is garnished with Leaves near 5 Inches long and half an Inch broad, which embrace the Stalk with their Base. The Spike of Flowers which occupies the upper Part of the Stalk is 6 Inches long; the Flowers are of a dirty white, with some linear Stripes and Spots of a brown Colour; the Beard or middle Segment of the Lip of the Nectarium is 2 Inches long, and appears as if it was obliquely bitten off. It flowers the latter End of June.

The 3d Sort grows naturally on dry Pastures, and upon Chalk Hills in several Parts of England. This has a handed bulbous Root; the Stalk rises near a Foot high; the lower Part is garnished with Leaves 3 Inches long and half an Inch broad, whose Bases embrace the Stalk. The Flowers grow in a long slender Spike on the Top of the Stalk; the Nectarium varies in Colour, it is sometimes of a dusky purple, and at others of a yellowish green Colour. It flowers the latter End of May, or the Beginning of June.

The 4th Sort grows near Verona, and upon the Alps. This hath several small Bulbs joined together; the Stalk rises about 8 Inches high, the lower Part is garnished with Spear-shaped Leaves about 3 Inches long, which embrace the Stalk with their Base. The Flowers are collected in a short thick Spike on the Top of the Stalk, and are of an herbaceous white Colour. This flowers in June.

All these Plants are difficult to propagate, so the best Way to obtain them, is to take up their Roots at a proper Season, and transplant them into the Gardens, putting the several Sorts into different Soils, as near to that in which they naturally grow as possible, and to leave the Ground undisturbed; for if their Roots are injured, the Plants seldom thrive after. The Management of this Plant being the same as for the Orchis, I shall not repeat it here.

SAVINE. See Juniperus.

SAVORY. See Satureja.

SAURURUS. *Lin. Gen. Pl.* 414. Lizards-tail.

The Characters are,

The Flowers are disposed in a Katkin or Tail; they have an oblong permanent Empalement of 1 Leaf, coloured on the Side. They have no Petal, but have 6 long Hair-like Stamina, placed three on each Side opposite, terminated by oblong erect Summits; and an oval Germen with 3 Lobes having no Style, but is crowned by three blunt permanent Stigmas. The Germen becomes an oval Berry with one Cell, inclosing one oval Seed.

We have but one Species of this Genus in the English Gardens, viz.

SAURURUS *foliis cordatis petiolatis, spicis solitariis recurvis. Hort. Upsal.* 91. Lizards-tail with Heart-shaped Leaves having Foot Stalks, and single recurved Spikes of Flowers. *Serpentaria repens, floribus flamineis spicatis, bryonia nigra folio ampliore pingui, Virginienfis. Pluk. Alm.* 343. Creeping Snakewort of Virginia with spiked stameneous Flowers, and a large, fat, black, briony Leaf.

This Plant grows naturally in most Parts of North America. The Root is fibrous and perennial; the Stalks rises near a Foot and a Half high, having some longitudinal

longitudinal Furrows; the Leaves are Heart-shaped and smooth; they are about 3 Inches long, and two broad at their Base, ending in obtuse Points, and have several longitudinal Veins which join at the Foot Stalk, but diverge from the Mid-rib toward the Borders in the Middle, and join again at the Point; these stand upon Foot Stalks about an Inch long, which are placed alternately on the Stalk. The Spike of Flowers comes out from the Wing of the Leaves toward the Top of the Stalk, which is taper, and about two Inches long; these appear in July, but make little Appearance, and are not succeeded by Seeds in England. The Stalk decays in Autumn.

This is preserved in Botanick Gardens for Variety, but, as it has no Beauty is very rarely admitted into other Gardens; it is propagated by parting the Root, which may be performed either in Autumn, soon after the Stalks decay, or in Spring, before the Roots begin to shoot; it loves a moist Soil and a shady Situation.

The other Plants, which in the former Editions of this Work were placed in this Genus, are now removed to the Genus of *Piper*.

SAXIFRAGA. *Tourn. Inst. R. H. 252. Tab. 129. Lin. Gen. Pl. 494.* Saxifrage.

The Characters are,

The Flower hath a short permanent acute Emplacement of 1 Leaf cut into 5 Parts; it has 5 plain Petals longer than the Emplacement, and 10 Awl-shaped Stamina, terminated by roundish Summits, with a roundish acute-pointed Germen sitting upon 2 Styles crowned by obtuse Stigmas. The Germen becomes an oval Capsule with 2 Horns opening between their Tops, and filled with small Seeds.

The Species are,

1. **SAXIFRAGA foliis caulinis reniformibus lobatis caule ramoso, radice granulata.** *Hort. Cliff. 167.* Saxifrage with Leaves upon the Stalks which are Kidney-shaped, having Lobes, a branching Stalk, and Roots like Grains of Corn. *Saxifraga rotundifolia, alba. C. B. P. 339.* Round-leaved white Saxifrage.

2. **SAXIFRAGA foliis radicans aggregatis lingulatis, cartilagineo-ferratis, caule ramoso.** Saxifrage with Tongue-shaped Leaves at the Root joined together, having cartilaginous Saws, and a branching Stalk. *Saxifraga folio sedis angustiore, serrato Tourn. Inst. R. H. 252.* Saxifrage with a narrow Houseleek Leaf sawed on its Edges.

3. **SAXIFRAGA foliis radicans aggregatis cuneiformibus cartilagineo-ferratis, caule paniculato.** Saxifrage with the lower Leaves Wedge-shaped and joined together, with Edges having cartilaginous Saws, and a paniculated Stalk. *Saxifraga foliis subrotundis ferratis Tourn. Inst. 252.* Saxifrage with roundish sawed Leaves.

4. **SAXIFRAGA foliis radicans aggregatis lingulatis cartilagineo-ferratis, caule pyramidato.** Saxifrage with the lower Leaves joined together, which are Tongue-shaped, and have cartilaginous Saws, and a pyramidal Stalk. *Saxifraga montana, pyramidata, folio longiore. Tourn. Inst. R. H. 253.* Mountain pyramidal Saxifrage with a Longer Leaf.

5. **SAXIFRAGA foliis caulinis dentatis reniformibus petiolatis.** *Lin. Sp. Pl. 403.* Saxifrage with Kidney-shaped Leaves on the Stalks which are indented, and have Foot Stalks. *Geum rotundifolium majus Tourn. Inst. 251.* Greater round-leaved Kidneywort.

6. **SAXIFRAGA foliis reniformibus dentatis, caule nudo paniculato.** *Lin. Sp. Pl. 401.* Saxifrage with indented Kidney-shaped Leaves, and a naked paniculated Stalk. *Geum folio circinato, pistillo floris pallido. Tourn. Inst. R. H. 251.* Round-leaved Kidneywort with a pale Pointal to the Flower.

7. **SAXIFRAGA foliis obovatis dentatis petiolatis, caule nudo paniculato.** *Lin. Sp. Pl. 401.* Saxifrage with oblong, oval, indented Leaves having Foot Stalks, and a naked paniculated Stalk. *Geum folio subrotundo majore, pistillo floris rubro. Tourn. Inst. R. H. 251.* Greater roundish-leaved Kidneywort, with a red Pointal to the Flower, commonly called London Pride or None-so-pretty.

8. **SAXIFRAGA foliis lanceolatis denticulatis, caule nudo paniculato, floribus subcapitatis.** *Lin. Sp. Pl. 399.* Saxifrage with Spear-shaped indented Leaves, a naked paniculated Stalk, and Flowers collected in Heads. *Saxifraga Pennsylvanica, floribus muscosis racemosis. Hort. Elth. 337.* Saxifrage of Pennsylvania with branching mossy Flowers.

9. **SAXIFRAGA foliis obovatis crenatis subsessilibus, caule nudo, floribus congestis.** *Lin. Sp. Pl. 401.* Saxifrage with oblong, oval, crenated Leaves sitting close to the Root, a naked Stalk, and Flowers growing in close Bunches. *Saxifraga foliis oblongo-rotundis dentatis, floribus compactis. Raii Syn. 3. 354.* Saxifrage with oblong, round, indented Leaves, and compact Flowers.

10. **SAXIFRAGA foliis caulinis linearibus alternis ciliatis, radicalibus aggregatis.** *Lin. Sp. Pl. 402.* Saxifrage with linear Leaves on the Stalk set with fine Hairs, and alternate, and those at the Root joined together. *Geum angustifolium autumnale, flore luteo guttato. Tourn. Inst. 252.* Narrow-leaved autumnal Kidneywort with a yellow spotted Flower.

11. **SAXIFRAGA foliis caulinis ovatis oppositis imbricatis, summis ciliatis.** *Flor. Succ. 359.* Saxifrage with oval Leaves on the Stalks which are opposite, and lie over each other, and upper Leaves having fine Hairs. *Sedum Alpinum ericoides purpurascens. C. B. P. 284.* Alpine purplish Houseleek like Heath.

12. **SAXIFRAGA foliis caulinis linearibus integris trifidis, stolonibus procumbentibus, caule erecto nudiusculo.** *Lin. Sp. Pl. 405.* Saxifrage with Linear Leaves on the Stalks which are entire or trifid, trailing Side Shoots, and erect Stalks almost naked. *Saxifraga muscosa trifido folio. Tourn. Inst. 252.* Mossy Saxifrage with a trifid Leaf, or Mountain Sea-green with jagged Leaves, commonly called Ladies Cushion.

There are many more Species of this Genus than are here enumerated, some of which grow naturally in Great-Britain; but, as they are very rarely admitted into Gardens, it would be needless to mention them in this Work.

The 1st Sort is the common white Saxifrage, which grows naturally in the Meadows in England. The Roots of this are like Grains of Corn, of a reddish Colour without, from which arise Kidney-shaped hairy Leaves standing on pretty long Foot Stalks. The Stalks are thick, a Foot high, hairy, and furrowed on two Sides; these branch out from the Bottom, and have a few small Leaves like those below, which sit close to the Stalk; the Flowers terminate the Stalk, growing

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in small Clusters; they have 5 small white Petals inclosing 10 Stamina and the two Styles. It flowers in *April*: The Roots and Leaves of this are used in Medicine.

There is a Variety of this which was found wild by Mr. *Joseph Blind*, Gardener at *Barns*, who transplanted it into his Garden, and afterward distributed it to several curious Persons, since which Time it hath been multiplied so much, as to become a very common Plant in most Gardens near *London*, where it is commonly planted in Pots to adorn Court Yards, &c. in the Spring, and is very ornamental at that Season in the Borders of the Flower Garden.

This Plant is propagated by Offsets, which are sent forth from the old Roots in great plenty. The best Season for transplanting them is in *July*, after their Leaves are decayed, when they must be put into fresh undunged Earth, and placed in the Shade until Autumn; but in Winter they may be exposed to the Sun, which will cause them to flower somewhat earlier in the Spring. In *April* these Plants will flower, and, if they are in large Tufts, will at that Time make a very handsome Appearance, for which Reason most People suffer them to remain three or four Years unremoved, and, when they are transplanted, always plant them in Bunches, that they may produce a greater Number of Flowers. If these Plants are put into the full Ground, they must have a shady Situation, otherwise they will not thrive.

The 2d Sort grows naturally on the *Alps*; this hath a perennial fibrous Root. The Leaves grow round in circular Heads, embracing each other at their Base, after the same Manner as the common House-leek; they are Tongue-shaped, about 2 Inches long, and a Quarter of an Inch broad, rounded at their Points, and have a white cartilaginous sawed Border. The Stalk rises about a Foot high, is of a purplish Colour, a little hairy, and sends out several horizontal Branches the whole length. The Flowers grow in small Clusters at the End of the Branches; they are white, and have several small red Spots on the Inside. This flowers in *June*.

It is easily propagated by Offsets, which are sent out in plenty; they may be taken off at almost any Season when the Weather is mild, and should be planted in a very dry Soil and a shady Situation.

The 3d Sort grows naturally on the *Alps*. The Leaves of this Sort are gathered into circular Heads like the former, but are not more than half an Inch long, and are Wedge-shaped, the upper Part being broad and rounded, but they diminish all the Way to their Base, where they are narrow; their Borders are edged and indented as those of the former. The Stalk, in the places where the Plant grows naturally, seldom rises more than 6 Inches high, but when transplanted into Gardens, is often more than a Foot; these have small Leaves fitting close to them their whole Length. The Flowers are disposed in loose Panicles on the Top of the Stalks; they are white and spotted with red. This Sort flowers in *June* and may be propagated as the former.

The 4th Sort grows naturally on the Mountains in *Italy*. The Leaves are gathered into circular Heads like those of the two former; they are 2 Inches long,

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and half an Inch broad, Tongue-shaped, rounded at their Points, and have cartilaginous sawed Borders. The Stalk rises a Foot and a Half high, branching out near the Ground, forming a natural Pyramid to the Top; the Flowers have 5 Wedge-shaped Petals which spread asunder; they are white, and have 10 Stamina placed circularly the Length of the Tube, terminated by roundish purple Summits. It flowers in *June*. When the Plants are strong, they produce very large Pyramids of Flowers, which make a fine Appearance, and are very ornamental for Halls, or Chimneys, where, being in the Shade, and screened from Winds and Rains, they continue in Beauty much longer, than in the open Air.

This Plant is easily propagated by Offsets, which are put out from the Side of the old Plants in plenty. These are usually planted in Pots filled with fresh light Earth, and in the Summer Season placed in the Shade, but in the Winter they should be exposed to the Sun, and all the Offsets taken off, leaving the Plants single, which will cause them to produce a much stronger Stem for flowering, for where there are Offsets about the old Plant, they exhaust the Nourishment from it, whereby it is rendered much weaker. These Offsets must be each planted in a separate Halfpenny Pot, filled with fresh Earth, in order to succeed the older Plants, which generally perish after flowering; these Offsets will produce Flowers the second Year, so that there should be annually some of them planted to succeed the others.

The 5th Sort grows naturally on the *Helvetian* Mountains; this hath a perennial Root. The Stalk is erect, about a Foot high, channeled and hairy; it is garnished with Kidney-shaped Leaves sharply indented, and puts out a few slender Foot Stalks from the Side toward the upper Part; these and also the principal Stalks are terminated by small Clusters with Flowers marked with several red Spots. This Sort flowers in *May*: It is propagated by parting the Roots; the best Time for this is in Autumn, that the Plants may have good Roots before the dry Weather in the Spring. It loves a shady Situation and a loamy Soil.

The 6th Sort grows naturally on the *Alps* and *Pyrenean* Mountains. The Root is fibrous and perennial; the Leaves are thick, Kidney-shaped, and crenated on their Edges; they are of a deep green on their upper Side, but pale on their under, standing on long thick hairy Foot Stalks; these branch out into a Panicle, which sustains several small white Flowers marked with red Spots; the Stamina of this Sort are longer than the Petals. It flowers in *June*. This Sort propagates very fast by Offsets, which should be taken off in Autumn, and planted in a shady Situation, where they will thrive fast enough.

The 7th Sort is known by the Titles of *London* Pride or *None-so-pretty*; it grows naturally on the *Alps*, and also in great Plenty on a Mountain called *Mangerton*, in the County of *Kerry* in *Ireland*. The Roots are perennial; the Leaves are oblong, oval, and placed circularly at Bottom; they have broad, flat, furrowed Foot Stalks near 2 Inches long; they are deeply crenated on their Edges, which are white; the

Stalk

Stalk rises about a Foot high, is of a purple Colour, stiff, slender, and hairy; it sends out from the Side on the upper Part several short Foot Stalks, terminated by white Flowers spotted with red; the Stamina are longer than the Petals of the Flower, as are also the two Styles; these have red Stigmas. It flowers in June, and may be propagated as the former; it loves a shady Situation.

The 8th Sort grows naturally in *North America*; this is a perennial Plant with a fibrous Root, from which arise several Leaves which are Spear-shaped; they are 7 or 8 Inches long, and two broad toward the Top, having several small Indentures on their Edges; they are of a deep green, and thick Consistence, spreading near the Ground. The Stalk rises a Foot and a Half high, is naked, and branches at the Top in Form of a Panicle, sustaining very small herbaceous Flowers, collected into small Heads. This Sort flowers in June.

It is propagated by parting the Root; the best Time is in Autumn; it loves a moist Soil and a shady Situation, and is never injured by Cold.

The 9th Sort grows naturally on some Mountains in *Wales*; it hath a fibrous perennial Root, from which come out oblong, roundish, Leaves; they are near two Inches long, and an Inch and a Half broad, deeply indented, or rather sawed on their Edges, sitting very close to the Root. The Stalk rises about 5 Inches high, is naked, and terminated by a close compact Cluster of white Flowers; these appear in July, and, if in a shady Situation, will continue almost a Month. This Plant must have a shady Situation and a loamy Soil, otherwise it will not thrive.

The 10th Sort grows naturally on the *Austrian Mountains*; it has also been found growing in Plenty on *Knotsford More in Cheshire*; this is a perennial Plant. The Leaves are gathered in Clusters at the Bottom; they are Spear-shaped, about two Inches long, and half an Inch broad in the Middle, drawing to a Point at both Ends; the Stalk rises about 6 Inches high, and is garnished with narrow Leaves the whole Length, placed alternately, and sitting close to the Stalks; the Flowers are produced in small Clusters at the Top of the Stalk; they have 5 yellowish Petals which spread open, and have several red Spots on their Inside. This Plant flowers in August. It is difficult to propagate in Gardens, for it naturally grows upon Bogs, so that unless it is planted in such loose rotten Earth, and kept constantly moist, it will not thrive.

The 11th Sort grows naturally upon the *Pyrenean and Helvetian Mountains*, as also upon *Ingleborough Hill in Yorkshire, Snowden in Wales*, and other high Places in the North of *England*; this is a perennial Plant, whose Stalks trail upon the Ground, and are seldom more than two Inches long; these are garnished with small oval Leaves standing opposite, which lie over each other like the Scales of Fish; they are of a brown green Colour, and have a Resemblance of Heath. The Flowers are produced at the End of the Branches; they are pretty large, and of a deep blue, so make a pretty Appearance during their Continuance, which is great Part of *March*, and the Beginning of *April*.

This is propagated by parting the Roots; the best Time for doing it is in Autumn: It must have a shady

Situation and a moist Soil, otherwise it will not thrive in Gardens.

The 12th Sort grows naturally upon the *Alps, Pyrenees, and Helvetian Mountains*; it is also found growing plentifully on *Ingleborough Hill in Yorkshire, Snowden in Wales*, and some other Places in the North; this is a perennial Plant, whose Branches spread flat upon the Ground, and put out Roots at their Joints; these are garnished with fine soft Leaves like Moss, some of which are entire, and others cut into 3 Points. The Branches join so close together, as to form a soft roundish Bunch like a Pillow or Cushion, from whence some have given it the Appellation of *Ladies Cushion*; the Stalks rise 3 or 4 Inches high; they are slender, erect, and have 2 or 3 small Leaves, some entire, and others trifid; they are of a bright green Colour, and soft to the Touch; the Flowers grow in small Bunches at the Top of the Stalk; they are small, and of a dirty Colour, so make no great Appearance; these come out in June.

This Sort propagates fast enough by its trailing Branches, provided it is planted in a moist Soil and a shady Situation, but it will not thrive in dry Ground, or where it is much exposed to the Sun. The best Time to remove any of these Plants is in Autumn, that they may have the Benefit of the Winter's Rain to establish them well before the dry Weather of the Spring comes on, for when they are planted late, they are very subject to die, unless they are supplied with Water, and they seldom make any Figure the first Year.

SCABIOSA. *Tourn. Inst. R. H.* 463. *Tab.* 263-⁶ 264. *Lin. Gen. Pl.* 108. Scabious.

The Characters are,

The common Empalement is composed of many Leaves, is spreading, containing many Flowers; it has several Series of Leaves surrounding the Receptacle upon which they sit; the inner are gradually smaller. The Flowers have a double Empalement, and sit upon the Germen; the outer is short, membranaceous, folded, and permanent; the inner is divided into 5 Awl-shaped capillary Segments. The Florets have one erect tubulous Petal cut into 4 or 5 Parts at the Brim; they have 4 weak Awl-shaped Hair-like Stamina terminated by oblong prostrate Summits. The Germen is situated under the Receptacle of the Florets, supporting a slender Style, crowned by an obtuse Stigma, obliquely indented; it becomes an oblong oval Seed sitting in the common Empalement, and crowned by the Cup of the Flower.

The Species are,

1. SCABIOSA *corollulis quadrifidis radiantibus, caule hispido. Hort. Cliff.* 31. Scabious with quadrifid radiated Florets, and a rough hairy Stalk. *Scabiosa pratensis hirsuta, quæ officinarum. C. B. P.* 269. Hairy Meadow Scabious of the Shops.

2. SCABIOSA *corollulis quadrifidis equalibus, caule simplicibus, ramis approximatis, foliis lanceolato-ovatis. Hort. Cliff.* 30. Scabious with quadrifid Florets which are equal, a single Stalk, and Branches growing near, with Spear-shaped oval Leaves. *Scabiosa integrifolia, glabra, radice premorsâ. H. L. B.* Scabious with an entire smooth Leaf, and a bitten Root.

3. SCABIOSA *corollulis quadrifidis equalibus, squamis calycinis ovatis obtusis. Lin. Sp. Pl.* 98. Scabious with quadrifid

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quadrifid Florets which are equal, and the Scales of the Empalement oval and obtuse. *Scabiosa altissima annua*, foliis agrimonie nonnihil similibus. H. L. B. Tallest annual Scabious with Leaves not unlike Agrimony.

4. *SCABIOSA corollulis quadrifidis fistulosis æqualibus*, squamis calycinis acutis, caule paniculato, foliis rigidis pinnatifidis. Scabious with quadrifid fistulous Florets which are equal, acute Scales to the Empalement, a paniculated Stalk, and stiff Wing-pointed Leaves. *Scabiosa annua fistulosa, centauroides*. H. Cath. Annual fistulous Scabious resembling the greater Centaury.

5. *SCABIOSA corollulis quadrifidis æqualibus*, flaminibus longioribus, squamis calycinis acutis, foliis radicalibus lanceolatis integerrimis, caulibus divisis. Scabious with quadrifid equal Florets, longer Stamina, acute Scales to the Empalement, and the lower Leaves Spear-shaped and entire, but those on the Stalks divided. *Scabiosa montana glabra, foliis scabiosæ vulgaris*. C. B. P. 270. Smooth Mountain Scabious with Leaves like the common Sort.

6. *SCABIOSA corollulis quadrifidis radiantibus*, caule hispido, foliis lanceolatis pinnatifidis, foliolis imbricatis, Lin. Sp. Pl. 99. Scabious with radiated quadrifid Florets, a rough hairy Stalk, and Spear-shaped Wing-pointed Leaves with Lobes set over each other in the Manner of Tiles. *Scabiosa altissima segetum, Triumph. Raii Hist. app.* 236. The tallest Corn Scabious.

7. *SCABIOSA corollulis quadrifidis æqualibus*, calycibus squamosis nitidis obtusis, caule dichotomo, foliis pinnatifidis. Scabious with equal quadrifid Florets, neat scaly Empalements which are obtuse, a Stalk divided by Pairs, and Wing-pointed Leaves. *Scabiosa fruticans angustifolia*. C. B. P. 270. Narrow-leaved shrubby Scabious.

8. *SCABIOSA corollulis quadrifidis radiantibus*, caule simplicis, foliis linearibus tomentosis. Scabious with radiated quadrifid Florets, a single Stalk, and linear woolly Leaves. *Scabiosa argentea angustifolia*. C. B. P. 271. Silvery narrow-leaved Scabious.

9. *SCABIOSA corollulis quinquefidis æqualibus*, caule erecto hispido, foliis lanceolatis denticulatis hirsutis, semiplexicaulibus. Scabious with equal quinquefid Florets, an erect Stalk which is rough and hairy, and Spear-shaped hairy Leaves somewhat indented, and which half embrace the Stalks. *Scabiosa virgæ pastoris folio*. C. B. P. 270. Scabious with a Shepherd's Rod Leaf.

10. *SCABIOSA corollulis quinquefidis, foliis pinnatis serratis, receptaculis florum globosis*. Scabious with quinquefid Florets, winged sawed Leaves, and globular Receptacles to the Flower. *Scabiosa Alpina foliis centaurei majoris*. C. B. P. 270. Alpine Scabious with Leaves like those of the greater Centaury.

11. *SCABIOSA corollulis quinquefidis radiantibus, foliis linearilanceolatis integerrimis, caule suffruticoso*. Scabious with radiated quinquefid Florets, linear, Spear-shaped, entire Leaves, and an under Shrub Stalk. *Scabiosa frutescens, foliis leucii bortenensis*. H. Cath. Shrubby-Scabious with a Stock Gilliflower Leaf.

12. *SCABIOSA corollulis quinquefidis, foliis lanceolatis subintegerrimis*. Hort. Cliff. 31. Scabious with quinquefid Florets, and Spear-shaped Leaves almost entire. *Scabiosa stellata, folio non dissecto*. C. B. P. 271. Starry Scabious with an undivided Leaf.

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13. *SCABIOSA corollulis quinquefidis radiantibus, foliis bipinnatis linearibus*. Lin. Sp. Plant. 101. Scabious with radiated quinquefid Florets, and linear doubly-winged Leaves. *Scabiosa multifido folio, flore flavescente*. C. B. P. 270. Scabious with a many-pointed Leaf and a yellowish Flower.

14. *SCABIOSA corollulis quinquefidis, foliis pinnatis, laciniis lanceolatis, pedunculis nudis lævibus longissimis*. Prod. Leyd. 190. Scabious with quinquefid Florets, winged Leaves having Spear-shaped Segments, and long, naked, smooth Foot Stalks. *Scabiosa Orientalis argentea, foliis inferioribus incis. Tourn. Cor.* 34. Silvery Eastern Scabious, whose lower Leaves are cut.

15. *SCABIOSA corollulis quinquefidis, foliis dissectis, receptaculis florum subulatis*. Hort. Cliff. 31. Scabious with five-pointed Florets, cut Leaves, and Awl-shaped Receptacles to the Flowers. *Scabiosa peregrina, capitula oblongo nigricante*. C. B. P. 270. Foreign Scabious with an oblong Head and black Flowers.

16. *SCABIOSA corollulis quinquefidis, foliis dissectis, receptaculis florum subrotundis*. Hort. Cliff. 31. Scabious with five-pointed Florets, cut Leaves, and roundish Receptacles to the Flowers. *Scabiosa stellata folio laciniato major*. C. B. P. 271. Greater starry Scabious with a cut Leaf.

17. *SCABIOSA corollulis quinquefidis, foliis inferioribus integris crenatis, caulibus inciso-crenatis, caule fruticoso*. Scabious with five-pointed Florets, the lower Leaves entire and crenated, those upon the Stalks bluntly cut, and a shrubby Stalk. *Scabiosa Africana frutescens*. Par. Bat. 219. Shrubby African Scabious.

18. *SCABIOSA corollulis quinquefidis, foliis inferioribus crenatis, caulibus duplicato-pinnatis, caule fruticoso hirsuto*. Scabious with five-pointed Florets, the under Leaves crenated, those on the Stalks doubly-winged, and a shrubby hairy Stalk. *Scabiosa Africana frutescens, maxima, foliis tenuissimis incis. Bærb. Ind. alt.* 1. 128. Greatest shrubby African Scabious, with Leaves very slightly cut.

19. *SCABIOSA corollulis multifidis, calycibus florum longioribus, caule ramoso foliis dissectis*. Scabious with many-pointed Florets, longer Empalements to the Flowers, a branching Stalk, and cut Leaves. *Scabiosa Orientalis stellata, foliis variis flore carneo, semisfasciis florum fimbriatis*. Edit. prior. Eastern starry Scabious, with various Leaves, a Flesh-coloured Flower, and the half Florets fringed.

The 1st Sort grows naturally in the Fields in divers Parts of England; this hath a strong, thick, fibrous Root, which runs deep into the Ground, sending out many branching Stalks, which rise near 3 Feet high; the lower Leaves are sometimes almost entire, and at others they are cut into many Segments almost to the Mid-rib; they are 7 or 8 Inches long, and from 3 to 4 broad in the Middle, hairy and sit close to the Root. The Stalks are covered with stiff prickly Hairs, and garnished with smaller Leaves at each Joint, cut into narrow Segments almost to the Mid-rib. The Flowers are produced on naked Foot Stalks at the End of the Branches, these have a double Empalement which is hairy, and are composed of several tubulous Florets, cut into 4 Points at the Top, each having a particu-

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lar Empalement resting upon the common Placenta. The Florets round the Border are larger and deeper cut, than those which compose the Disk or Middle, their outer Segments being much longer than the two Side ones, and those are longer than the inner Segment; they have 4 weak Stamina, which soon shrink after the Flowers open. In the Center is situated a Style, longer than the Floret, terminated by a roundish Stigma. The Flowers are of a pale purple Colour, and have a strong faint Odour; they appear in *June*, and the Stalks decay to the Root every Autumn. This is the Sort intended by the College of Physicians for medicinal Use, under the Title of *Scabiosa*.

The 2d Sort grows naturally in moist Woods and Pastures in most Parts of *England*, and is directed by the College of Physicians to be used, under the Title of *Morsus Diaboli*, or Devil's Bit; this hath a short Tap Root, which appears as if the End of it were bitten or cut off, from whence it had the Titles of *Succisa*, and *Morsus Diaboli*. The Leaves are oval, Spear-shaped, and smooth; they are 4 Inches long, and two broad in the Middle, drawing to a Point at each End; the Stalks are single, about 2 Feet high, garnished with 2 Leaves at each Joint, shaped like those below, but smaller; they generally send out two short Foot Stalks from their upper Joint standing opposite, which are each terminated by one small blue Flower, as is also the principal Stalk with one larger. These are constructed as the former, and appear in *August*. As these Plants are to be found plentifully in the Fields and Woods, so they are seldom admitted into Gardens.

The 3d Sort grows naturally in *Transylvania*; this is an annual Plant, which is preserved in Botanick Gardens for Variety, but rarely allowed a Place in other Gardens. The Stalks rise 4 or 5 Feet high, dividing into several Branches; the Leaves are hairy, and cut almost to the Mid-rib. The Flowers are small, of a pale purplish Colour, and appear in *July*; the Seeds ripen in Autumn, when, if they are permitted to scatter, the Plants will come up without Care; if these are thinned and kept clean from Weeds, it is all the Culture they require.

The 4th Sort grows naturally in *Spain* and *Portugal*; it is an annual Plant, the Stalk is stiff, and rises upward of 3 Feet high, dividing toward the Top into several Branches, which are again divided into naked Foot Stalks, each sustaining one small, pale, purplish Flower, composed of many Florets; the Leaves are stiff, and cut into many winged Points. It flowers and seeds about the same Time as the former.

The 5th Sort grows naturally on the *Alps* and *Appennines*; this hath a perennial Root, from which come out many entire, smooth, Spear-shaped Leaves; the Stalk is single, sending out two short naked Foot Stalks from the upper Joint; the Leaves are cut pretty deeply on their Edges. The Flowers are nearly of the same Size and Form with those of the first Sort; it may be propagated by Seeds, and will thrive in a shady moist Border, requiring no other Care but to keep the Ground clean, and allow them Room to spread.

The 6th Sort is a biennial Plant, which grows naturally in some Parts of *Italy*, and also in *Tartary*. It rises with a strong branching Stalk, 4 or 5 Feet high,

closely armed with stiff prickly Hairs; the lower Leaves are Spear shaped, about 7 Inches long, and near 4 broad in the Middle, cut deeply on the Sides in winged Points; those upon the Stalks are more entire, some of them are sharply sawed on their Edges, and those at the Top are linear and entire. The Flowers grow from the Sides and at the Top of the Stalks, they are white, and each Floret sits in a bristly Empalement. This flowers in *July*, and the Seeds ripen in Autumn; it rises from scattered Seeds, and requires no Care.

The 7th Sort grows naturally in *Isria*; this hath a perennial Root; the lower Leaves are almost entire, and sawed on their Edges; the Stalk is stiff and rises 2 Feet high dividing into 2 upward, which spread asunder, and in the Division arises a naked Foot Stalk, which (as also the Side Branches) is terminated by single Flowers, composed of many white Florets, inclosed in a scaly Empalement, whose Scales are obtuse; the Leaves on the Stalks are Wing-pointed and stiff. This flowers in *July*, but seldom produces good Seeds here; it is propagated by parting the Roots in Autumn, and delights in a light loamy Soil.

The 8th Sort grows naturally on the Mountains in *Italy*; this has a perennial Root, from which arise 3 or 4 Stalks, whose lower Parts are garnished with linear Leaves about 4 Inches long, and the 8th of an Inch broad, of a silvery Colour, ending in acute Points: The upper Part of the Stalk is naked for 6 or 7 Inches in Length, sustaining at the Top one pale blue Flower, made up of several four-pointed Florets. This Plant flowers in *July*, but does not produce Seeds in *England*; it is propagated by Slips, which should be planted on a shady Border the Beginning of *April*; when these have put out good Roots, they may be taken up with Balls of Earth, and transplanted where they are to remain. This Plant loves a soft loamy Soil, and a shady Situation.

The 9th Sort grows naturally on the *Alps*; this has a perennial Root, from which arise several pretty strong hairy Stalks near 3 Feet high, garnished with Spear-shaped Leaves about 4 Inches long and two broad; these are placed opposite, and embrace the Stalks half round with their Base; they are of a dark green on their upper Side, but pale on their under and hairy, having a few Indentures on their Edges, and end in acute Points. The Flowers are produced at the Top of the Stalks, as those of the first Sort, and are like them; these appear in *June*, and the Seeds ripen in Autumn. This is hardy, and loves a light loamy Soil and a shady Situation; it is propagated by Seeds.

The 10th Sort grows naturally on the *Alps*; this has a perennial Root, composed of many strong Fibres which root deep in the Ground, from which arise several strong channelled Stalks upward of 4 Feet high, garnished with winged Leaves composed of 4 or 5 Pair of Lobes, unequal in Size and irregularly placed; they are sawed on their Edges, and end in acute Points. The Flowers are produced on naked Foot Stalks at the End of the Branches, the Receptacles are globular; the Flowers are of a whitish yellow, and appear the latter End of *June*. the Seeds ripen in Autumn. This may be propagated, either by Seeds or parting the Roots; it loves a loamy Soil.

The 11th Sort grows naturally in *Sicily*; this rises with a shrubby Stalk 3 Feet high, and divides into several ligneous knotty Branches, garnished with narrow silvery Leaves, 4 Inches long and a Quarter of an Inch broad, which are entire. The Flowers stand on very long naked Foot Stalks at the End of the Branches, they are made up of many five-pointed tubulous Florets, of a fine blue Colour. These appear in *July*, but are not succeeded by Seeds here. It is propagated by Slips or Cuttings, which readily take Root if they are planted in any of the Summer Months, if they are shaded from the Sun, and duly refreshed with Water. When these have made good Root, some of them may be planted on a dry Border near to a South Wall, where they will live in common Winters; but as they are frequently destroyed by severe Frost, so some of the Plants should be planted in Pots, and in Winter placed under a common Frame, where they may be protected from Frost, but in mild Weather enjoy the free Air.

The 12th Sort grows naturally in *Crete*; this hath a shrubby Stalk which rises about the same Height as the former, and divides into many Branches, the Leaves are shorter, much broader, and not so white as those of the former Sort; the Flowers are not so large, and are of a pale purple Colour. This Sort flowers from the End of *June* till Autumn, but does not ripen Seeds in *England*. It is propagated by Slips or Cuttings as the former, and requires the same Treatment.

The 13th Sort grows naturally in *Germany*; this hath a perennial Root, from which come out many Leaves that spread near the Ground, about 5 or 6 Inches long, divided into narrow Segments to the Mid-rib; these Segments are cut on their Edges into regular acute Points, like winged Leaves; the Stalks rise near 2 Feet high, and are garnished with very narrow cut Leaves; they divide into several long Foot Stalks, each being terminated by a yellowish Flower, with radiated Borders. This flowers in *July*, and the Seeds ripen in Autumn. It may be propagated by Seeds, and will thrive any where.

The 14th Sort grows naturally in the *Levant*; this is a low perennial Plant, with a branching Stalk which spreads wide on every Side; the lower Leaves are cut, but the upper Leaves are narrow and entire; they are of a silvery Colour. The Flowers are small, of a pale Colour, and have no Scent, so is only kept in Botanick Gardens for Variety. It is propagated by Seeds, and is hardy enough to live in the open Air.

The 15th Sort grows naturally in *India*; this is an annual Plant, cultivated in Gardens for Ornament. Of this there is a great Variety in the Colour of their Flowers, some are of a purple approaching to black, others of a pale purple, some red, and others have variegated Flowers; these also vary in the Shape of their Leaves, some of them having finer cut Leaves than others; and sometimes from the Side of the Flower Cup, there come out many slender Foot Stalks, sustaining small Flowers like the Hen and Chicken Daisies; but as these are accidental Varieties which come from the same Seeds, so they need not be particularly enumerated here.

The Flowers of this Sort are very sweet, and continue

a long Time. The Plants are propagated by sowing their Seeds, the best Time for which is about the latter End of *May* or Beginning of *June*, that the Plants may get Strength before Winter; for if they are sown too early in the Spring, they will flower the Autumn following; and the Winter coming on soon, will prevent their ripening Seeds; besides, there will be fewer Flowers upon those, than if they had remained strong Plants through the Winter, and had sent forth their Flower Stems in Spring; for these will branch out on every Side, and produce a prodigious Number of Flowers, and continue a Succession of them on the same Plants from *June* to *September*, and produce good Seeds in Plenty.

The Seeds of these Plants should be sown on a shady Border of fresh Earth (for if they are sown upon a Place too much exposed to the Sun, and the Season should prove dry, few of them will grow.) When the Plants are come up, they may be transplanted into other Beds or Borders of fresh Earth, observing to water and shade them until they have taken Root; after which they will require no farther Care, but to keep them clear from Weeds till *Michaelmas*, when they may be transplanted into the Middle of the Borders in the Pleasure Garden, where the several Sorts being intermixed, will make an agreeable Variety. They are extreme hardy, being rarely injured by Cold, unless they have shot up to flower before Winter, but do not continue after ripening their Seeds.

The 16th Sort grows naturally in *Spain*; this is an annual Plant, the Stalks rise 3 Feet high, they are hairy, and garnished with oblong Leaves deeply notched on their Edges, and those on the upper Part of the Stalk, cut almost to the Mid-rib into fine Segments. The Flowers stand on long Foot Stalks at the Top of the Stalks; these have globular Receptacles; the Florets are large, and spread open like a Star; they are of a pale purple Colour, appearing in *July*, and in favourable Seasons the Seeds ripen in *September*, but in cold moist Years the Seeds do not ripen here.

It is propagated by Seeds, which should be sown in Beds of light loamy Earth, where the Plants are to remain; when the Plants come up, they must be thinned and kept clear from Weeds, which is all the Culture they require.

The 17th Sort grows naturally at the *Cape of Good Hope*; this hath a weak shrubby Stalk which divides into several Branches, and rises about 5 Feet high; the Branches are garnished with oval Spear-shaped Leaves 3 Inches long, and an Inch and a Half broad, which are entire and deeply crenated on their Edges; they are of a light green, and a little hairy. The Flower Stalk is produced at the End of the Branches, sustaining one pale Flesh-coloured Flower, composed of many 5 pointed Florets. This Plant continues flowering great Part of Summer, and sometimes it produces good Seeds in *England*.

The 18th Sort is also a Native of the *Cape of Good Hope*; it hath a shrubby Stalk like the former; the Stalks are hairy, and divide into several Branches, garnished toward the Bottom with Spear-shaped Leaves which are crenated and entire, but those on the upper Part of the Stalk are doubly winged. The Flowers are produced

produced upon long naked Stalks from the End of the Branches, they are of a pale Flesh Colour, and large, but have no Scent; these are continued in Succession all the Summer, and sometimes the early Flowers are succeeded by Seeds, which ripen in Autumn.

Both these Sorts may be propagated by Cuttings, which may be planted in a shady Border during any of the Summer Months; when these have put out good Roots, they should be taken up and planted in Pots filled with light loamy Earth, and placed in the Shade till they have taken new Root; then they may be removed to a sheltered Situation, where they may remain till the Frosts begin; when they should be removed to Shelter, for they are too tender to live in the open Air through the Winter; but as they only require Protection from Frost, so they should have as much free Air as possible in mild Weather, to prevent their being drawn up weak; and in the Middle or latter End of April, they may be placed in the open Air in a warm Situation, afterward treating them as other hardy foreign Plants.

The 19th Sort grows naturally about Aleppo; this is an annual Plant, with a very branching Stalk near 3 Feet high, garnished with Leaves at each Joint that are variously cut. The Flowers are produced on long Foot Stalks at the End of the Branches, these have very long Empalements; the Florets round the Border are cut into several fringed Segments. The Flowers are of a Flesh Colour, and continue in Succession from July to Autumn, and in favourable Seasons the Seeds ripen here pretty well. This is propagated by Seeds, which should be sown, and the Plants treated as the common Sweet, or Indian Scabious.

There are several other Species of this Genus, but as they are Plants which have little Beauty, so they are rarely admitted into Gardens, therefore they are not enumerated here.

SCANDIX. Tourn. Inst. R. H. 326. Tab. 173. Lin. Gen. Pl. 319. Shepherds Needle, or Venus-comb.

The Characters are,

It hath an umbelliferous Flower; the general Umbel is long and has few Rays, the particular Umbels have many: The general Umbel has no Involucrum, the particular has a free-leaved one the Length of the Umbels: The general Umbel is deformed, and has hermaphrodite Florets in the Disk, and female in the Rays. The Flowers have 5 inflexed Heart-shaped Petals, the inner small, and the outer large; they have 5 slender Stamina terminated by roundish Summits, an oblong Germen supporting 2 permanent Styles, crowned by obtuse Stigmas. The Germen turns to a long Fruit divided in two Parts, each having one furrowed Seed convex on one Side, and plain on the other.

The Species are,

1. SCANDIX *feminibus levibus rostro longissimo*. Hort. Cliff. 101. Scandix with smooth Seeds and the longest Beak. Scandix *femine rostrato vulgaris*. C. B. P. 152. Common Shepherds Needle with beaked Seeds.

2. SCANDIX *feminibus subulatis hispida, floribus radiatis, caulibus levibus*. Lin. Sp. Pl. 257. Scandix with prickly Awl-shaped Seeds, radiated Flowers, and smooth Stalks. Scandix *Cretica minor*. C. B. P. 152. Smaller Shepherds Needle of Candy.

3. SCANDIX *feminibus pedunculo villoso brevioribus*.

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Flor. Leyd. 111. Scandix with a hairy Foot Stalk and short Seeds Scandix *Orientalis flore maxima*. Tourn. Cor. 23. Eastern Shepherds Needle with a very large Flower.

4. SCANDIX *feminibus hispida, involucris umbello multifidis, caulibus asperis*. Scandix with bristly Seeds, many-pointed Involucrums to the Umbels, and rough Stalks. Scandix *Cretica major*. C. B. P. 152. Greater Shepherds Needle from Candy.

5. SCANDIX *feminibus sulcatis angulatis*. Hort. Cliff. 101. Scandix with angular furrowed Seeds. Myrrbis *major cicutaria odorata*. C. B. P. 160. Sweet Cecily, or great sweet Chervil, by some sweet Fern.

6. SCANDIX *feminibus ovatis hispida, corollis uniformibus, caule laevi*. Lin. Sp. Pl. 257. Scandix with oval rough Seeds, the Petals of the Flowers uniform, and a smooth Stalk. Myrrbis *sylvestris feminibus asperis*. C. B. P. 160. Wild Myrrh with rough Seeds.

The 1st Sort grows naturally in stiff Lands among the Corn in many Parts of England, so is not cultivated in Gardens. It is an annual Plant; the Leaves are finely divided into small Segments, and have long Foot Stalks; the Stalks branch and rise 6 Inches high. The Flowers are small, white, and like those of wild Chervil, and sit on the Top of the Beak or Horns, which are the Rudiment of the Pod. At the Bottom of the small Umbel 5 Leaves embrace the Stalk, with broad and short Foot Stalks, which are afterward cut into small Segments like the rest: The Seed is long, and runs into a small Point, resembling a large Needle, but the Umbels have great Resemblance to the Umbels of Musk Crane's-bill. It flowers in June, and the Seeds ripen the End of July, which, if permitted to scatter, there will be a plentiful Supply of young Plants.

The 2d Sort grows naturally in the South of France, in Italy, and Crete. This is an annual Plant with low spreading Stalks, garnished with very narrow fine cut Leaves, placed thinly. The Flowers are small, white, and stand in small Umbels at the Top of the Stalks, these are succeeded by Awl-shaped rough Seeds. It flowers and seeds about the same Time as the former.

The 3d Sort grows naturally in the Levant; this is an annual Plant, with fine cut Leaves; the Stalks rise 8 Inches high, garnished at each Joint with a fine cut Leaf, and terminated by an Umbel of white Flowers, with large Heart-shaped Petals. The Horns of this are longer than of any other Sort, and the Foot Stalks are very short and hairy.

The 4th Sort grows naturally in Crete; this hath larger Leaves than either of the former, and are finely cut; the Stalks grow a Foot long, and divide into many Branches, they are rough and channelled; the Umbels have a many-leaved Involucrum, and the Seeds are rough. It flowers at the same Time as the former.

These 4 Sorts will sow themselves where-ever they are once introduced, and require no other Care but to thin them, and keep them clean from Weeds.

The 5th Sort grows naturally in Germany, but has been long kept in the English Gardens; and of late Years the Seeds have been thrown out of Gardens, so that the Plants are frequently found growing naturally in the Neighbourhood of those Gardens. It has a very thick perennial Root, composed of many thick Fibres, of a sweet aromack Taste like Aniseed, from which

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come forth many large Leaves, that branch out somewhat like those of Fern, from whence it was titled Sweet Fern. The Stalks grow 4 or 5 Feet high, they are hairy and fistulous. The Flowers are disposed in an Umbel at the Top of the Stalk, they are white, and have a sweet aromatick Scent: The out Petal of the Flowers is large, the two Side ones are of a middle Size, but the two inner are small; these appear the latter End of May, and are succeeded by long angular furrowed Seeds, having the Taste and Scent of Aniseed, which ripen in July.

This Sort propagates fast by Seeds, which, if permitted to scatter, will furnish Plants in abundance. These may be transplanted to any abject Part of the Garden, for they will grow in any Soil or Situation, and require no Care.

It stands in the List of medicinal Plants, but is rarely used: Formerly the young Leaves of this Plant were put into Sallads, but it has been long disused for the Table in England, but in Germany it is put into Soups.

The 6th Sort grows naturally on the Side of Banks and Foot Ways in many Parts of England; this is an annual, whose Seeds drop early in the Summer; the Plants come up in Autumn, and flower early in the Spring. The Leaves are finely divided, very like those of the Garden Chervil, but are hairy; the Stalks rise a Foot and a Half or two Feet high, dividing into Branches. These sustain Umbels of small white Flowers, which come out early in April, and are succeeded by short hairy crooked Seeds, which ripen in June, and soon after the Plants decay.

There have been some Instances of the ill Effects of this Plant, when taken inwardly; some who have eaten this Herb in Soups, by mistaking it for Garden Chervil, have narrowly escaped with their Lives.

SCHINUS. *Lin. Gen. Pl.* 479. *Melle. Tourn. Inst. R. H.* 661. Indian Mastick.

The Characters are,

The Flower hath a small Empalement with 5 Indentures at the Top; it has 5 small Petals which spread open, and 9 or 10 slender Stamina terminated by thick Summits, with a roundish Germen supporting a short thick Style, crowned by a single Stigma. The Germen turns to a globular Berry with one Cell, inclosing one globular Seed.

The Species are,

1. SCHINUS foliis pinnatis, foliolis serratis, impari longissimo, petiolo aequali. *Lin. Sp. Pl.* 388. Schinus with winged Leaves whose Lobes are sawed, the End one being very long, and the Foot Stalks equal. *Lentiscus Peruviana. C. B. P.* 399. Peruvian Mastick Tree; and the *Melle. Clus. Monard.* 322. the *Arbor Melle.*

2. SCHINUS foliis pinnatis, petiolo marginato articulato subtus aculeato. *Lin. Sp. Pl.* 389. Schinus with winged Leaves, and jointed bordered Foot Stalks having Thorns below. *Rboi obscuriorum similis leptophyllas tragodes Americana spinosa, racbi medio appendicibus acuto. Pluk. Phyt. Tab.* 107. fig. 4. American Plant like Sumach, with small Leaves armed with Spines, and Appendages to the Mid-rib.

These are all the Species of this Genus which I have seen growing in the English Gardens, for the Iron Wood of Jamaica, which Dr. Linnaeus has ranged in this Genus, has male and female Flowers on different Trees;

and the male Flowers which have blown here, are *Polyandria*, so cannot be here placed.

The 1st Sort grows naturally in Peru and Mexico; from both these Countries I have received the Seeds. This rises with a woody Stalk 8 or 10 Feet high, dividing into many Branches covered with a dark brown Bark; the Leaves are placed alternate on the Branches, they are composed of several Pair of Lobes, from 10 to 15, and are terminated by one Lobe longer than the others; the Lobes are about an Inch and a Half long, and a Quarter of an Inch broad at their Base, lessening gradually to the Point, with a few Saws on their Edges; they are of a lucid green, and when bruised emit a Turpentine Odour. The Flowers are produced in loose Bunches at the End of the Branches, they are very small, white, and have no Odour, composed of 5 small Petals, which spread open; these have small Empalements of one Leaf, indented in 5 Parts at the Brim. They appear in July, but are not succeeded by Seeds in England.

This Plant is propagated best by Seeds, which must be procured from the Countries where they naturally grow; these should be sown in Pots filled with fresh Earth, and plunged into a moderate hot Bed. If the Seeds are good, the Plants will appear in about 5 or 6 Weeks; and if properly managed, by admitting fresh Air daily to them, according to the Warmth of the Season, and duly refreshing them with Water, they will be fit to transplant about five or six Weeks after, when they should be carefully turned out of the Pots and their Roots separated; then they must be each planted in a small Pot filled with soft loamy Earth, and plunged again into a moderate hot Bed, shading them from the Sun till they have taken fresh Root; then they must be gradually inured to the open Air, into which they should be removed soon after, placing them in a sheltered Situation, where they may remain till Autumn, but they must be removed into Shelter before the first Frosts, otherwise their Tops will be killed, and thereby the Plants are frequently destroyed.

These Plants are tender when young, so require a little Warmth in Winter; but after 2 or 3 Years Growth, they will live in a good Green-house, where, as they retain their Leaves all the Year, they will make a good Variety. It may also be propagated by Layers and Cuttings; the Layers should be put down in the Spring, and by the following Spring they will be rooted; the Cuttings should be planted in April, which will put out Roots in about two Months, and may afterward be treated as the seedling Plants.

The 2d Sort grows naturally in the West-Indies; this rises with a ligneous Stalk 8 or 10 Feet high, sending out many Branches on every Side the whole Length; these have a grayish Bark, and are garnished with winged Leaves, whose Mid-rib is bordered and jointed, and are armed with crooked Spines under each joint. The Lobes are small, oblong, and of a lucid green, the Spines short and crooked. This Sort has not yet produced Flowers in the English Gardens, so I can give no farther Description of it.

It is propagated by Seeds, which should be sown in small Pots filled with light Earth, and plunged into a hot Bed of Tanners Bark; these Seeds will often lie

3 or 4 Months in the Ground, and sometimes a whole Year; therefore if the Plants should not come up the same Year, the Earth should not be disturbed in the Pots, but placed in the Winter in the Bark Bed in the Stove, and the Spring following plunged again into a fresh hot Bed, which will bring up the Plants, if the Seeds are good. When the Plants are come up, and are fit to remove, they should be each planted in a separate small Pot filled with fresh Earth, and plunged into the Tan Bed, where they must be shaded till they have taken new Root, after which they must be treated as other tender Stove Plants.

SCILLA. Lin. Gen. Pl. 378. *Lilio-Hyacinthus*. Tourn. Inst. R. H. 371. Tab. 196. Squills.

The Characters are,

The Flower has no Empalement; it has 6 oval Petals which spread open like a Star, and 6 Awl-shaped Stamina not more than half the Length of the Petals, terminated by oblong prostrate Summits. It has a roundish Germen supporting a single Style, crowned by a single Stigma. The Germen becomes a smooth oval Capsule with 3 Furrows divided into 3 Cells filled with roundish Seeds.

The Species are,

1. SCILLA radice tunicatâ. Hort. Cliff. 123. Squill with a coated Root. *Scilla vulgaris, radice rubra*. C. B. P. 73. Common Squill with a red Root.
2. SCILLA radice squamatâ. Hort. Cliff. 123. Squill with a scaly Root. *Lilio-Hyacinthus, vulgaris, flore caeruleo*. Tourn. Inst. 372. Common Lily Hyacinth with a blue Flower.
3. SCILLA radice solidâ, corymbo conferto hemisphærico. Lin. Sp. Pl. 308. Squill with a solid Root, and an hemispherical Corymbus of Flowers. *Ornithogalum spicatum caeruleum*. Tourn. Inst. R. H. 380. Blue spiked Star-flower.
4. SCILLA radice solidâ, corymbo conferto conico. Lin. Sp. Plant. 309. Squill with a solid Root, and a conical Corymbus of Flowers. *Ornithogalum caeruleum Lufitanicum, latifolium*. Tourn. Inst. 381. Portugal blue broad-leaved Star-flower, commonly called Hyacinth of Peru.
5. SCILLA radice solidâ, floribus lateralibus alternis subnatis. Hort. Cliff. 123. Squill with a solid Root, and Flowers growing alternately from the Sides of the Stalk, which almost nod. *Hyacinthus stellaris caeruleus amœnus*. C. B. P. Fine blue starry Hyacinth.
6. SCILLA radice solidâ, floribus lateralibus erectiusculis paucioribus. Hort. Cliff. 123. Squill with a solid Root, and erect Flowers growing thinly. *Ornithogalum bifolium Germanicum caeruleum*. Tourn. Inst. 380. Blue German Star-flower with two Leaves, commonly called the early blue starry Hyacinth.
7. SCILLA radice solidâ, foliis filiformibus linearibus, floribus corymbofis, pedunculis nudis adscendentibus longitudine floris. Lin. Sp. Pl. 309. Squill with a solid Root, slender linear Leaves, Flowers growing in a Corymbus, and naked Foot Stalks rising over each other to the Length of the Flowers. *Ornithogalum autumnale minus, floribus caeruleis*. Tourn. Inst. 381. Smaller autumnal Star-flower with blue Flowers, commonly called autumnal starry Hyacinth.
8. SCILLA radice solidâ, floribus paniculatis subnatis. Squill with a solid Root, and Flowers growing

in Panicles which almost nod. *Ornithogalum Hispanicum saturâ caeruleum*. Tourn. Inst. 381. Star-flower of Spain with deep blue Flowers.

9. SCILLA radice solidâ, racemo conico, floribus numerosis adscendentibus. Squill with a solid Root, and a conical Spike of many Flowers rising above each other. *Ornithogalum purpureum*. Tourn. Inst. 380. Purple Star-flower.

10. SCILLA radice solidâ, corymbo conferto hemisphærico, scapo longissimo. Squill with a solid Root, an hemispherical Corymbus, and the longest Stalk. *Ornithogalum Eriophorum, Peruvianum*. Tourn. Inst. 381. Woolly Star-flower of Peru.

The 1st is the Squill or Sea Onion whose Roots are used in Medicine, of which there are 2 Sorts, one with a red, and the other a white Root, which are supposed to be accidental Varieties, but the white are generally preferred for medicinal Use. The Roots are very large, somewhat Pear shaped, composed of many Coats lying over each other like Onions; at the Bottom come out several Fibres which strike deep in the Ground. From the Middle of the Root arise several shining Leaves a Foot long, and 2 Inches broad at their Base, lessening all the Length to the Top, where they end in Points; they continue green all the Winter, and decay in the Spring, and then the Flower Stalk comes out, which rises 2 Feet high, is naked about half Way, and terminated by a pyramidal Thyse of white Flowers, composed of 6 Petals which spread open like the Points of a Star. This grows naturally on the Sea Shores, and in the Ditches, where the Salt Water flows in with the Tide, in most of the warm Parts of Europe, so cannot be propagated in Gardens, the Frost in Winter always destroying the Roots, and for Want of Salt Water they do not thrive in Summer. Sometimes the Roots, which are brought for Use, put out their Stems, and produce Flowers without being planted in Earth, as they lie in the Druggists Shops.

The 2d Sort grows naturally in Spain, Portugal, and the Pyrenees; this has a scaly Root like the Lilly, for which Reason Tournefort separated it from the starry Hyacinth, and constituted a Genus of it with the Title of *Lilio-Hyacinthus*. The Root is oblong and yellow, very like those of *Martagon*; the Leaves are shaped like those of the white Lilly, but are smaller; the Stalk is slender, and rises a Foot high; it is terminated by blue Flowers like those of the starry Hyacinth. It flowers in June, and the Flowers are succeeded by oval Seed Vessels having 3 Cells filled with roundish Seeds.

The 3d Sort grows naturally in Portugal; this hath a roundish solid bulbous Root like the Hyacinth. The Leaves come out sparsedly, and are very like those of the English Hair Bells; the Stalk rises 7 or 8 Inches high, and is terminated by clustered Flowers of a pale blue Colour, which at first are disposed in a Sort of Umbel or depressed Spike, but afterward draws up to a Point, forming a conical Corymbus; the Flowers appear the latter End of April, which are succeeded by oval Capsules with three Cells filled with roundish Seeds.

The 4th Sort grows naturally in Spain and Portugal, from whence I have received the Roots; this has been

long known in the *Engliſh* Gardens by the Title of Hyacinth of *Peru*. There are two Varieties of this, one with a deep blue, and the other has a white Flower; the latter is more rare here than the former. The Root of this is large, ſolid, and raiſed in the Middle a little pyramidal, covered with a brown Coat, from which come out 5 or 7 Leaves before Winter, which are 6 or 8 Inches long, broadest at their Baſe, terminating in Points; they are of a lucid green, keeled, and ſpread almoſt flat on the Ground. From the Center of theſe come out 1, 2, or 3 Stalks according to the Strength of the Root; theſe are thick, ſucculent, and riſe 6 or 8 Inches high, terminated by a conical Corymbus of Flowers, of a deep blue in ſome, and white in others, ſtanding on pretty long Foot Stalks; they are compoſed of ſix Petals which ſpread open like a Star. In the Center of the Petals is ſituated a large roundiſh Germen, ſupporting a ſhort Style crowned by a ſingle Stigma, and round the Germen come out 6 ſhort Stamina, which ſpread aſunder, terminated by oblong proſtrate Summits. The Germen afterward turns to a roundiſh three-cornered Capſule having 3 Cells filled with roundiſh Seeds. It flowers in *May*, and the Seeds ripen in *July*.

The 5th grows naturally in *Byzantium*, and was introduced here about the Year 1590. The Root of this is large, ſolid, and of a purpliſh Colour, from which come 5 or 6 Leaves which lie on the Ground; they are above a Foot long, and an Inch broad; they are keeled, channelled, and of a lucid green; between theſe ariſe 2, 3, or 4 purpliſh Stalks about 8 or 9 Inches high, ſuſtaining toward the Top 5 or 6 Star-flowers, which come out ſingly from the Side of the Stalk; they are of a Violet blue Colour, having a prominent Germen in the Center ſupporting a ſlender Style, attended by ſix ſlender Stamina terminated by purple Summits. It flowers in *April*, and the Seeds ripen in *June*.

The 6th Sort is commonly known in the Gardens by the Title of early ſtarry Hyacinth. There are two Varieties of this, one with a deep blue, and the other with a white Flower; theſe grow naturally in ſome Parts of *France* and *Germany*. The Roots are ſolid, roundiſh, and about the Size of a Nutmeg, from which comes out a ſlender channelled Stalk about 6 Inches high, having generally two Leaves near the Bottom, one ſituated above the other, which embrace the Stalk with their Baſe; theſe are about 6 Inches long, and almoſt three Quarters of an Inch broad, channelled, and of a bright green. The Flowers are thinly placed toward the Top of the Stalk; the lower ones have Foot Stalks an Inch and a Half long, but thoſe of the others ſhorten gradually to the Top; they are compoſed of 6 Petals ſpreading open in Form of a Star, having a turgid Germen in the Center, ſupporting a ſhort Style, attended by 6 Stamina, which in the blue Flowers are of the ſame Colour, and thoſe in the white Flowers are white. The Flowers appear in *March*, and are ſucceeded by roundiſh three-cornered Capſules, having three Cells, filled with browniſh Seeds.

The 7th Sort is the ſmall autumnal ſtarry Hyacinth, which grows naturally in ſeveral Parts of *England*, particularly on *St. Vincent's Rock* near *Briſtol*, at the *Lizard Point* in *Cornwall*, and upon *Black Heath* in *Kent*; this has a round white bulbous Root, from which come

forth a few ruſhy Leaves about 6 Inches long. In the Center of theſe ariſe 1 or 2 ſlender Stalks about 6 or 7 Inches high, naked, and ſuſtaining a ſmall Corymbus of Flowers at the Top, which are ſmall, Star-pointed, and of a pale blue Colour; theſe appear the Beginning of *September*, at which Time the Leaves come out, and continue growing all the Winter, and in the Spring they die away.

The 8th Sort grows naturally in *Spain* and *Portugal*; this hath an oblong white bulbous Root, from which come out 5 or 6 Leaves a Foot long, and half an Inch broad, of a lucid green, and a little keeled. The Flower Stalk riſes 9 or 10 Inches high is firm, and ſuſtains many ſtarry Flowers at the Top, diſpoſed in a looſe Panicle, each ſtanding on a pretty long Foot Stalk which is erect, but the Flower nods on one Side; they are of a deep blue Violet Colour, having a prominent Germen, which afterward turns to a three-cornered Capſule, having 3 Cells, filled with roundiſh Seeds. It flowers in *May*.

The 9th Sort grows naturally in *Italy*; this hath a ſolid white bulbous Root, from which riſe ſeveral Leaves like thoſe of the common Sort. The Stalk riſes 10 or 11 Inches high, and is terminated by a conical Racemus of Flowers, of a deep purple Colour. This Sort flowers in *May*, and the Seeds ripen in *July*.

The 10th Sort has a very large bulbous Root, from which come out ſeveral Leaves which at firſt are upright, but afterward bend toward the Earth; they are of a thick Substance and keeled; they are of a lucid green, and, when broken, yield downy Threads; they are a Foot and a Half long, and more than an Inch broad. Between the Leaves ariſes the Flower Stalk, a Foot and a Half long, round, firm, and naked, ſuſtaining at the Top a large Cluster of Flowers, gathered into an hemiſpherical Corymbus; theſe have 6 Petals which ſpread open in Form of a Star; they are of a purple Colour, and have blue Bottoms, and a dark blue Vein running Lengthwiſe in the Middle of each Petal. This flowers the Beginning of *June*, and produces Seeds which ripen in *Auguſt*.

There is another Sort of this which grows naturally in the *Levant*, whoſe Leaves are ſhaped like thoſe of the *Peruvian* Hyacinth, but are longer, and ſtand erect; this propagates very faſt by Offsets, but never flowers here. I have kept the Roots in all Situations more than 30 Years, and have not ſeen one Flower.

Theſe Plants are all of them hardy, and may be propagated by Seeds or Offsets, the latter being the more expeditious Way is generally praſtiſed. The Roots may be tranſplanted after the Leaves are decayed, but, if they are removed after they have put out new Fibres, they rarely ſucceed; at leaſt they will not flower the following Spring; they may be treated in every Reſpect like the ordinary Kinds of Hyacinths.

If they are propagated by Seeds, they ſhould be ſown in Autumn, ſoon after they are ripe, either in ſhallow Boxes or Pans as has been before directed for Hyacinths, to which the Reader is deſired to turn, to avoid Repetition.

SCLAREA. *Tourn. Inſt. R. H.* 179. *Tab.* 82. *Salvia Lin. Gen. Pl.* 36. *Clary*; in *French*, *Toute-bonne*.

The

The Characters are,

The Flower has a tubulous Empalement of 1 Leaf, which widens at the Top, and has 5 acute Points at the Brim; it is of the Lip Kind, with 1 Petal having a crooked Tube which enlarges at the Chaps, where it is divided into 2 Lips; the upper Lip is erect and arched; the under Lip is cut into 3 Segments, the middle one being largest and hollowed like a Spoon; it has 2 Stamina, situated under the upper Lip, terminated by oblong erect Summits, and a four-pointed Germen, supporting a forked Style longer than the upper Lip, crowned by a bifid Stigma. The Germen becomes four roundish Seeds, which ripen in the Empalement.

The Species are,

1. *SCLAREA foliis rugosis oblongo-cordatis serratis, floribus calyce longioribus concavis acuminatis.* Clary with rough, oblong, Heart-shaped, sawed Leaves, those among the Flowers concave, pointed, and longer than the Empalement. *Sclarea Tab. Icon. 373.* Common Clary.

2. *SCLAREA foliis oblongis dentato-angulatis tomentosis, verticillis lanatis.* Clary with oblong, angular, indented, woolly Leaves, and the Whorls of the Flowers covered with Down. *Sclarea vulgaris lanuginosa amplifimo folio. Tourn. Inst. 179.* Common woolly Clary with the largest Leaf.

3. *SCLAREA foliis oblongo-ovatis dentato-serratis tomentosis, verticillis lanatis sessilibus.* Clary with oblong oval woolly sawed Leaves, and woolly Whorls of Flowers sitting close to the Stalk. *Sclarea Lusitanica glutinosa, amplifimo folio Tourn. Inst. 179.* Clammy Portugal Clary with a very large Leaf.

4. *SCLAREA foliis ovatis sinuato-dentatis tomentosis, caule erecto, verticillis lanatis sessilibus.* Clary with oval, sinuated indented Leaves which are woolly, an erect Stalk, and woolly Whorls sitting close to the Stalks. *Sclarea Sicula, folio argenteo subrotundo. Boerh. Ind. alt. 1. 163.* Sicilian Clary with a round silvery Leaf.

5. *SCLAREA foliis cordato-oblongis crenatis summis amplexicaulibus, verticillis subnudis, corollarum galeis glutinosis.* Clary with oblong, Heart-shaped, crenated Leaves, those on the Top embracing the Stalk, almost naked Whorls, and the Helmet of the Flower glutinous. *Sclarea protensis, foliis serratis, flore caeruleo. Tourn. Inst. 180.* Meadow Clary with sawed Leaves and a blue Flower.

6. *SCLAREA foliis lanceolatis obsolete crenatis subtus tomentosis, verticillis minoribus subnudis.* Clary with Spear-shaped Leaves slightly crenated, and woolly on their under Side, and very small Whorls of Flowers almost naked. *Sclarea Syriaca, flore caeruleo. Tourn. Inst. 180.* Syrian Clary with a blue Flower.

7. *SCLAREA foliis cordato-oblongis crenatis glabris, floribus verticillato-spicatis.* Clary with oblong, Heart-shaped, crenated, smooth Leaves, and spiked whorled Flowers. *Sclarea folio salvie minor sive glabra. Tourn. Inst. 180.* Smaller Clary with a smooth Sage Leaf.

8. *SCLAREA foliis cordato-lanceolatis acutis, bracteis coloratis, flore brevioribus.* Clary with Heart-shaped acute-pointed Leaves, and coloured Bractes shorter than the Flower. *Sclarea folio salvie major, vel maculata. Tourn. Inst. 180.* Clary with a greater or spotted Sage Leaf.

9. *SCLAREA foliis rugosis pinnatifidis lanatis.* Clary

with rough, Wing-pointed, woolly Leaves. *Sclarea rugosa verrucosa, & laciniato folio. Tourn. Inst. 180.* Clary rough, warted, cut Leaves.

10. *SCLAREA foliis cordatis acutè crenatis, summis sessilibus, verticillis subnudis remotissimis.* Clary with Heart-shaped Leaves sharply crenated, those on the Top sitting close to the Stalks, and naked Whorls placed far asunder. *Sclarea Indica, floribus variegatis Tourn. Inst. 179.* Indian Clary with variegated Flowers.

11. *SCLAREA foliis lanceolatis acuminatis, serratis, summis sessilibus, floribus verticillato-spicatis.* Clary with Spear-shaped, acute-pointed, sawed Leaves, the upper ones sitting close to the Stalks, and spiked whorled Flowers. *Sclarea orientalis, folio betonica acutissima, comâ purpurascens. Tourn. Cor. 10.* Eastern Clary with an acute Betony Leaf, and a purplish Top.

12. *SCLAREA foliis cordato-sagittatis serratis acutis.* Clary with Heart-shaped crenated Leaves acutely sawed. *Horminum luteum glutinosum. C. B. P. 238.* Yellow glutinous Clary.

13. *SCLAREA foliis ovato-lanceolatis integerrimis, summis cordatis amplexicaulibus hirsutis.* Clary with oval, Spear-shaped, entire Leaves, those above Heart-shaped, embracing the Stalks, and hairy. *Horminum bugula folio Horteg.* Clary with a Bugle Leaf.

14. *SCLAREA foliis cordato-ovatis rugosis tomentosis, calycibus bispidis, radice tuberosâ.* Clary with oval, Heart-shaped, rough, woolly Leaves, prickly Empalements, and a tuberous Root. *Sclarea asphodeli radice. Tourn. Inst. R. H. 179.* Clary with an Asphodel Leaf.

15. *SCLAREA foliis hastato-triangularibus obsolete crenatis, caule tomentoso paniculato.* Clary with triangular Halberd-pointed Leaves slightly crenated, and a woolly paniculated Stalk. *Sclarea folio triangulari, caule tomentoso. Tourn. Inst. 180.* Clary with a triangular Leaf and a woolly Stalk.

16. *SCLAREA foliis obtusis erosis, staminibus corollâ duplo longioribus. Præd. Leyd. 309.* Clary with obtuse bitten Leaves, and Stamina twice the Length of the Petal of the Flower. *Sclarea Mexicana altissima, facie beliotropii Hort. Elth. 339.* Tallest Mexican Clary with the Appearance of Turnsol.

The 1st Sort grows naturally in Syria, but has been long cultivated in the European Gardens, both for the Kitchen and Shops; it is a biennial Plant, which perishes after it has borne Seeds. The lower Leaves of this are large, rough, and wrinkled; they are oblong and Heart-shaped; in good Ground they are 7 or 8 Inches long, and 4 broad at their Base, ending in blunt Points, and sawed on their Edges. The Stalks are large, four-cornered, and clammy; they rise about 2 Feet high, and are garnished at Bottom with Leaves of the same Shape but smaller; they send out smaller Side Branches which are opposite, as are also the Leaves; the Flowers are disposed in large loose Spikes at the Top of the Stalks; they are placed in Whorls round them, and are of a pale blue Colour, having 2 short hollow acute-pointed Leaves under each, which are thin, and of a whitish Colour. The Empalement of the Flower is divided into 2 Parts or Lips, the upper ending in three, and the under in two Spiculae. The upper Lip of the Flower stands erect; it is long, and arched at the Top, under which is the Style nearly

of the same Length, and the two Stamina, which are shorter, sit close to the Style. After the Flowers are past, the Germen turns to four roundish Seeds, which ripen in the Empalement. The whole Plant has a very strong Scent; it flowers in *June* and *July*, and the Seeds ripen in *September*.

It is propagated by Seeds, which should be sown in the Spring, and when the Plants are fit to remove, they should be either transplanted into Beds, or if a large Quantity is required, they may be planted in an open spot of Ground in Rows two Feet asunder, and one Foot Distance in the Rows. After the Plants have taken Root, they will require no farther Care, but to keep them clean from Weeds. The Winter and Spring following the Leaves, which are the only Part used, will be in Perfection, and in the Summer they will run up to flower; and after they have ripened their Seeds, decay, so that there should be annually young Plants raised for Use. It will thrive on almost any Soil that is not very wet, for in moist Ground the Plants frequently rot in Winter.

The 2d Sort grows naturally in *Istria* and *Dalmatia*; there are two Varieties of this, one with very broad Leaves but slightly indented on the Sides, the other has longer Leaves deeply jagged. The Leaves of both Sorts are of a thick Substance, and very woolly, especially on their under Side; their upper Sides are rugged and wrinkled like the 1st Sort, and have several longitudinal Veins, which diverge from the Mid-rib. The Stalks are square, and rise about 2 Feet high, sending out many Branches by Pairs opposite, garnished in the first with entire, oval, acute-pointed Leaves, which embrace the Stalks with their Base, but those of the other are long, narrow, and have several deep Indentures on their Edges. The upper Part of the Stalk and Branches is garnished with Spikes of Flowers in Whorls; under each of these Whorls are two hollow green Leaves shorter than the Empalements of the Flowers; these Empalements are divided into 2 Lips, the upper ending in three, and the under in two Spiculae. The under Lip or Beard of the Flower is white, and the Helmet or Galea is of a pale blue Colour. These Sorts flower, and perfect their Seeds the same Time as the first, and perish soon after; they may be treated as the first.

The 3d Sort has some Resemblance of the second, but the Leaves are larger, very woolly, and glutinous they are oblong, oval, deeply indented, and end with very acute Points. The Stalks are woolly, four-cornered and rise about two Feet and a Half high, sending out Side Branches by Pairs; these terminate in loose Spikes of whorled Flowers which are white, and the Whorls are smaller than those of the other Sorts. It flowers and seeds about the same Time as the former, and the Plants soon after decay; it grows naturally in *Portugal* and *Syria*; it is propagated by Seeds as the first.

The 4th Sort grows naturally in *Sicily* and the *Archipelago*. The Roots of this will continue 3 or 4 Years; the Leaves are oval, very thick and woolly, and have a few Indentures on their Borders; the Stalks are generally single and erect. When they send out any Branches, it is only at Bottom, and scarce ever more than 2, which also grow erect. The Flowers grow

in pretty thick Whorls almost the Length of the Stalks; they are white, and shaped like those of the former, appearing about the same Time, and the Seeds ripen in Autumn. This may be propagated by Seeds as the former, but loves a dry Soil.

The 5th Sort grows naturally in some Parts of *France* and *Germany*; it is generally found in Meadows and rich Pastures; this has a perennial Root composed of many strong ligneous Fibres, from which come out many oblong Heart-shaped Leaves of a deep green Colour, whose Surfaces are rough; they are crenated on their Edges, and stand on pretty long Foot Stalks. The Stalks rise 3 Feet high; they are 4 cornered, and their lower Parts are garnished with Leaves, whose Bases embrace them; the Flowers grow in long whorled Spikes at the Top; they are smaller than those of the former Sorts, and are of a fine blue Colour, having scarce any small Leaves under the Whorls. This flowers the latter End of *May*, and the Seeds ripen in *July*; it is propagated by Seeds, but the Roots continue long.

The 6th Sort grows naturally in *Syria*; this is an abiding Plant whose Roots run deep in the Ground. The Leaves are Spear-shaped; the lower ones are about 4 Inches long, and an Inch and a Half broad in the Middle; they are crenated on their Edges, and a little woolly on their under Side. The Stalks are slender, stiff, and rise a Foot and a Half high; they are garnished with smaller Leaves of the same Shape, set on by Pairs; the Flowers grow in small Whorls disposed in loose Spikes at the Top of the Stalks; they are small, blue, and shaped like those of the other Sorts. This flowers in *July*, and the Seeds ripen in Autumn; it is propagated by Seeds as the other Sorts.

The 7th Sort grows naturally on the Sides of Highways about *Vienna* and all over *Hungary*; this has an abiding Root sending out many smooth Leaves about the Size and Shape of those of broad-leaved Sage, but indented on their Edges. The Stalks are slender, four-cornered, and rise a Foot and a Half high; their lower Parts are garnished with Leaves like those at the Bottom but smaller; the upper Parts are garnished with spiked small Whorls of blue Flowers which appear in *June*, and are succeeded by Seeds which ripen in *August*. It is propagated by Seeds as the first Sort but the Roots will continue several Years.

The 8th Sort grows naturally in *Austria* and *Bohemia*; this has an abiding Root, from which come out many Heart Spear-shaped Leaves about 4 Inches long, and one and a Half broad; they are crenated on their Edges, of a bright green Colour, and have many white Spots dispersed on their Surface. The Stalks are thick, four-cornered, and rise near 3 Feet high, garnished below with Leaves by Pairs sitting close to the Stalks, but their upper Parts have long loose Spikes of Flowers in small Whorls, whose Bractææ are coloured. This flowers in *June*, and the Seeds ripen in *August*; it is propagated by Seeds as the former Sorts.

The 9th Sort grows naturally in *Syria*; this is a biennial Plant which dies after it has borne Seeds. The Leaves of this Sort are very thick and woolly; they are 8 or 9 Inches long, narrow and Wing-pointed, being cut into obtuse Segments nearly opposite on their Sides, almost to the Mid-rib, somewhat like a Stags Horn in Shape; these

these spread flat on the Ground. The Stalk rises more than a Foot high; it is thick, four-cornered and very woolly sending out Branches by Pairs, and is garnished with narrow long Leaves placed by Pairs at each Joint, which are sawed on their Edges. The Flowers grow in loose whorled Spikes at the Top of the Stalks; they are white and shaped like those of the 4th Sort. This flowers in *June*, and the Seeds are ripe in *August*; it may be propagated by Seeds as the first Sort, but should have a dry Soil, lest the Plants rot in Winter.

The 10th Sort grows naturally in *India*, but is hardy enough to live in the open Air in *England*. The Root of this will abide several Years in a dry Soil; the lower Leaves are Heart-shaped, acutely crenated on their Edges, and of a thick Consistence; they are 7 or 8 Inches long, and 4 broad at their Base, where they are eared. The Stalk is four-cornered, and rises 4 Feet high, having 2 or 3 Pair of smaller Leaves on the lower Part, which stand opposite at the Joints. The upper Part of the Stalk for the Length of 2 Feet is garnished with Whorls of Flowers which stand at 2 or 3 Inches Distance from each other, having no Leaves under the Whorls. The Empalement of the Flower is hairy and blunt; the Galea or Helmet of the Flower is arched, erect, and blue, terminating in a blunt Point; the two Side Segments of the under Lip are of a Violet Colour; the middle Segment, which is indented at the Point, is white, and curiously spotted with Violet on the Inside; the two Side Indentures turn yellow, before the Flower drops. When the Flower is past, the German turns to four large roundish Seeds which ripen in the Empalement. This Sort flowers in *May*, and the Seeds ripen in *July*; it is propagated by Seeds as the other Sorts.

The 11th Sort grows naturally in the *Levant*, where it was discovered by Dr. *Tournefort*, who sent the Seeds to the Royal Garden at *Paris*; this hath a perennial Root, from which come out many Spear-shaped Leaves, about 4 Inches long, and one Inch and a Half broad in the Middle, of a dark green Colour, sawed on their Edges, and ending in acute Points. The Stalks rise 3 Feet high, sending out Branches by Pairs their whole Length; these are garnished with Leaves by Pairs, which toward the Top sit close to the Stalk. The Flowers grow in whorled Spikes at the Top, having no Leaves under them; they are small, of a bright blue Colour, and the Top of the Spike is terminated with very deep blue Flowers; these appear in *July*, and are succeeded by Seeds which ripen in *September*. It is propagated by Seeds as the other Sorts, and the Roots abide many Years.

The 12th Sort grows naturally in moist Land both in *Germany* and *Italy*; this hath an abiding Root composed of strong ligneous Fibres. The Leaves are Heart-shaped and pointed like a Halberd; they are 4 Inches long, and 3 broad at their Base, of a pale or yellowish green Colour, and sawed on their Edges, standing on Foot Stalks 3 or 4 Inches long. The Stalks are strong, four-cornered, and rise near 4 Feet high; they are garnished below with smaller Leaves, but the upper Part of the Stalk is closely set with Whorls of large yellow Flowers, which appear in *June*, and are succeeded by Seeds which ripen in *August*. The whole Plant is very

clammy, and has a strong Scent somewhat like the first Species; this is propagated by Seeds as the other Sorts; it is very hardy, and will continue several Years, and may be increased by parting the Roots in Autumn.

The 13th Sort grows naturally in *Spain*; this has a perennial Root. the lower Leaves are oval and Spear-shaped; they are 6 Inches long, and 3 broad in the Middle, ending with obtuse Points, and are entire, the Stalks rise 2 Feet high, they are large, four-cornered, and send out Branches by Pairs at the Joints; the Leaves on the upper Part of the Stalks are Heart-shaped, and embrace the Stalks with their Base; the Flowers are of a Brimstone Colour, and shaped like those of the first Sort; the Style of this is much longer than the upper Lip, and is terminated by a bifid Stigma; the Empalements are hairy, and end with acute Points. This flowers in *July*, and the Seeds ripen in Autumn; it is propagated by Seeds as the other Sorts, and the Plants may be treated in like Manner.

The 14th Sort grows naturally in *Italy*; this has large swelling Roots like Dugs, or those of the Piony, from which arise many oval Heart-shaped Leaves lying on the Ground; they are 5 or 6 Inches long, and almost 4 broad at their Base, where they are eared; they have pretty long Foot Stalks, and are hairy; their Edges are indented and a little wrinkled; Between these arise strong four-cornered Stalks about 4 Feet high, garnished with Leaves placed opposite. The upper Part of the Stalk is garnished with loose Spikes of whorled Flowers, of a purple Colour, which appear in *June*, and are succeeded by Seeds which ripen in Autumn. This is propagated by Seeds as the other Sorts, and the Roots will continue several Years.

The 15th Sort grows naturally in the *Canary Islands*; this hath a perennial shrubby Stalk, which rises 5 or 6 Feet high, dividing into many Branches covered with a flocky Down, and garnished with Halberd-shaped triangular Leaves three Inches and a Half long, and one and a Half broad at their Base, where are two acute angular Ears; they are placed opposite, standing on long woolly Foot Stalks. The Top of the Stalk branches out in many Foot Stalks, forming a Sort of Panicle. The Flowers are of a light blue Colour, and are ranged in whorled Spikes, having 2 small Leaves under each Whorl. This Plant flowers from *June* to Autumn, but rarely produces any Seeds here. It is propagated by Cuttings, which may be planted any Time in Summer; if these are planted in a Bed of soft loamy Earth, and covered close with a Bell or Hand Glass, observing to shade them from the Sun, and refresh them with Water as they may require it, they will take Root very freely, and then they must be inured to the open Air; after they have put out good Roots they should be carefully taken up, and each planted into a separate small Pot, filled with light fresh Earth, placing them in the Shade till they have taken new Root; then they may be placed among other hardy Kinds of Green-house Plants in a sheltered Situation till *October*, when they should be removed into Shelter before hard Frost comes on; but as they only require Protection from hard Frost, so they should have as much free Air as possible in mild Weather.

The 16th Sort grows naturally in *Mexico*; this rises with

with a shrubby Stalk 8 or 10 Feet high, sending out slender four-cornered Branches, of a purplish Colour and hairy; these are garnished with oval Leaves pointed at both Ends and sawed on their Edges; they have long slender Foot Stalks, and are thin, of a pale green Colour, and hairy on their under Side. The Flowers grow in close thick Spikes at the End of the Branches, they are of a fine blue Colour and appear in Winter, so make a pretty Variety in the Green-house at that Season. This Plant never produces Seeds in England, so it is propagated by Cuttings, which may be planted during any of the Summer Months, as the former Sort; and the Plants may be treated afterward the same Way, with this Difference, to give it a dry Situation in Winter, for the young Shoots are very apt to grow mouldy in a damp Air.

There are some other Sorts of less Note, preserved in Botanick Gardens for Variety, but those here mentioned are worthy of a Place in large Gardens, where, if intermixed among other large growing Plants, they will afford a pretty Variety; especially the 5th, 8th, 10th, and 11th Sorts, which produce long Spikes of beautiful Flowers and continue a long Time in flower. The Flowers of the 12th Sort are used in Holland, to give a Flavour to the *Rhenish* Wines, which are brewed at Dort.

All these Sorts may be propagated by sowing their Seeds on a Bed of fresh Earth in March; and when the Plants come up, they should be transplanted into Beds of fresh Earth, about 8 Inches asunder, observing to water them until they have taken Root; after which they will require no farther Care, but to keep them clear from Weeds until *Michachmas*, when they should be transplanted into the Places where they are to remain, placing them at a large Distance, for they spread pretty far, provided the Soil be good. If so, they should be planted 8 or 10 Feet distant, being intermixed with other Plants. Some of these Sorts will endure several Years, provided they are planted on a fresh Soil, not over moist or rich.

SCOLYMUS *Tourn. Inst.* 480. *Tab.* 273. *Lin. Gen. Pl.* 826. The Golden Thistle; in French, *Epine Jaune*.

The Characters are,

It hath a Flower composed of many *bermaderite* Florets, included in an oval imbricated Empalement, having many loose sharp-pointed Scales. The Florets are Tongue-shaped, of one Petal, which is torn and slightly indented in 5 Parts. They have 5 short Hair-like Stamina, terminated by tubulous Summits. The Germen is situated under the Floret, supporting a slender Style longer than the Stamina, crowned by two reflexed Stigmas. The Germen becomes a single Seed, which is oblong, triangular and ripens in the Empalement, the Seeds being separated by plain, roundish, indented Chaff.

The Species are,

1. SCOLYMUS *foliis margine attenuatis. Lin. Sp. Pl.* 813. Golden Thistle with Leaves thinner on the Borders. *Scolymus chrysanthemum annuus. Acl. Reg. Par.* 111. Annual Golden Thistle.

2. SCOLYMUS *foliis margine incrassatis. Lin. Sp. Pl.* 813. Golden Thistle with Leaves thicker on the Borders. *Scolymus chrysanthemum. C. B. P.* 384. Golden Thistle.

The 1st Sort grows naturally in the South of France

and in Italy; this is an annual Plant, which rises with a branching Stalk 4 or 5 Feet high, having 2 leafy Wings running along the Sides from Joint to Joint scolo-ped and indented; the Borders of these are thinner than the other Parts and are armed all the Way with very sharp Spines; at each Joint are placed stiff Leaves, jagged and armed with strong Spines; they are of a pale green, and sit close to the Stalks. The Flowers are produced at the Top of the Stalks inclosed in leafy Involucra longer than the Flowers, and armed with very strong Spines; within these are scaly Empalements, which lie over each other like the Scales of Fishes, and are armed with short Spines. The Flowers are composed of many golden Florets, which do not appear till the Middle or latter End of July; and unless the Autumn proves warm and dry, the Seeds do not ripen in England.

The 2d Sort grows naturally in Italy and Sicily; this hath a perennial Root, from which spring up many thick Stalks, that rise about 3 Feet high, branching out on the Sides the whole Length, and garnished with stiff jagged Leaves, whose Borders are thicker than the other Part, and armed with Spines like the former Sort; the Stalks have leafy Borders as the other, strongly armed with Spines. The Flowers are produced at the Top of the Stalks, and are shaped like those of the former Sort. These appear in July, and if the Season proves warm and dry, they will be succeeded by Seeds, which ripen in Autumn.

They are propagated by Seeds, which should be sown in March, on a Bed of Fresh undunged Earth, in an open Situation; when the Plants come up, they should be kept clear from Weeds; and where they grow too close, some of them should be pulled out, so as to leave those which are to remain, about two Feet asunder. This is all the Culture they require, for as they send forth Tap Roots, they do not bear transplanting well; therefore they must be sown where they are to remain, and if they are kept clear from Weeds, they will thrive very well, and when the Seasons prove dry, will perfect their Seeds in Autumn; but in wet Seasons they rarely ever produce good Seeds in England, which renders it difficult to continue the Species, without procuring fresh Seeds from Abroad.

These Plants are preserved by the curious in Botany for Variety, but are rarely planted in other Gardens.

SCOPARIA. See Capraria.

SCORDIUM. See Teucrium.

SCORPIURUS *Lin. Gen. Pl.* 792. *Scorpioides. Tourn. Inst. R. H.* 402. *Tab.* 226. Caterpillars; in French, *Cbenille*.

The Characters are,

The Empalement of the Flower is of 1 Leaf, and is erect, blown up, lightly compressed, ending in 5 acute Points. The Flower is of the Butterfly Kind; it has roundish Standard indented at the Point, where it is reflexed and spreading. The Wings are loose, almost oval, having obtuse Appendages. The Keel is Half-moon-shaped, the Belly is gibbous, pointed, and erect, cut into 2 Parts below. It hath 10 Stamina 9 joined and 1 separate, terminated by small Summits; and an oblong taper Germen a little reflexed, supporting a rising inflexed Style, terminated by a Point for a Stigma. The Germen becomes an oblong, taper, leathery,

leathery, rough, channelled Pod, twisted in many longitudinal Cells divided within, and on the Outside contracted into knotty Joints, each Cell containing one Seed.

The Species are,

1. *SCORPIURUS pedunculis unifloris, leguminibus teclis undique squamis obtusis. Lin. Sp. Pl. 744.* Caterpillar with one Flower on a Foot Stalk, and a Pod covered with obtuse scales on every Side. *Scorpioides siliqua crassa boellii Tourn. Inst. 402.* Caterpillar with a thick Pod.

2. *SCORPIURUS pedunculis bifloris, leguminibus extrorsum obtuse aculeatis. Lin. Sp. Pl. 745.* Caterpillar with two Flowers on each Foot Stalk, and the Outside of the Pods armed with blunt Spines. *Scorpioides bupleuri folio siliquis lenibus. Park. 1117.* Caterpillar with a Hare's-ear Leaf and a smoother Pod.

3. *SCORPIURUS pedunculis subtrifloris, leguminibus extrorsum spinis distinctis acutis. Lin. Sp. Pl. 745.* Caterpillar with Foot Stalks having three Flowers, and the Outside of the Pods armed with sharp distinct Spines. *Scorpioides bupleuri folio. C. B. P.* Caterpillar with a Hare's-ear Leaf,

4. *SCORPIURUS pedunculis subquadrifloris, leguminibus extrorsum spinis confertis acutis. Lin. Sp. Pl. 745.* Caterpillar with 4 Flowers sometimes on a Foot Stalk, and the Outside of the Pods armed with sharp Spines which grow in Clusters. *Scorpioides bupleuri folio, corpiculis asperis, magis in se contortis & convolutis. Mor. Hist. 2. 127.* Caterpillar with a Hare's-ear Leaf, and a rough Pod greatly contorted and twisted.

5. *SCORPIURUS foliis pinnatis.* Caterpillar with a winged Leaf. *Scorpioides foliis vicie minima. Mor. Hist. 2. 127.* Smallest Caterpillar with a Vetch Leaf.

The 1st Sort grows naturally in Italy and Spain; this is an annual Plant, with trailing herbaceous Stalks, above a Foot long; they lie on the Ground, and at each Joint have one Spatule-shaped Leaf with a long Foot Stalk. From the Wings of the Leaves come out the Foot Stalks of the Flowers, 9 Inches long, sustaining at the Top one yellow Butterfly Flower, which is succeeded by a twisted thick Pod, in Size and Appearance of a large Caterpillar, from whence it had this Title. It flowers in July, and the Seeds ripen in Autumn.

The 2d Sort has stronger Stalks than the first; the Leaves are much broader; the Foot Stalks support two smaller Flowers; the Pods are slender, longer, and more twisted than those of the 1st, and are armed with blunt Spines on their Outside.

The 3d Sort hath slenderer Stalks than either of the former; the Leaves stand on shorter Foot Stalks but are shaped like those of the first Sort; the Foot Stalks of the Flowers are slender, and frequently support 3 Flowers; the Pods are slender, not so much twisted as the former, and are armed on their Outside with sharp distinct Spines.

The Stalks and Leaves of the 4th Sort are very like those of the first, but the Foot Stalks of the Flowers are longer, and each of them have 3 or 4 small yellow Flowers at the Top; the Pods are very slender, greatly contorted, and armed with sharp Spines in Clusters on their Outside.

The 5th Sort has very short Stalks; the Leaves are winged; they are composed of 4 Pair of small Lobes terminated by an odd one. The Flowers are very small,

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as are also their Pods, which are less twisted than those of the three former.

All these Plants are annual, and grow naturally in most of the warm Countries in Europe, but the first Sort has been long cultivated in the English Gardens.

These Plants are preserved in several curious Gardens, for their Oddness more than for any great Beauty: they are all of them annual Plants, which are propagated by sowing their Seeds on a Bed of light fresh Earth; when the Plants come up, they should be thinned, so as to leave them about 10 Inches or a Foot asunder, because their Branches trail on the Ground; and if they have not Room, they are apt to overbear each other, and rot, especially in moist Seasons. The Weeds should also be diligently cleared from them, otherwise they will grow over, and destroy them. In June these Plants will produce small yellow papilionaceous Flowers, which are succeeded by Pods, so much like Caterpillars, that a Person at a small Distance, would imagine they were real Caterpillars feeding on the Plants, and it is for this Oddness of their Pods that these Plants are chiefly preserved.

These Plants seldom thrive well if transplanted; therefore the Best Method is, to put in three or four good Seeds in each Place, where you would have the Plants remain (which may be in the Middle of large Borders in the Pleasure Garden, where being intermixed with other Plants, they will afford a pleasing Variety.) When the Plants come up, there should be only one of the most promising left in each Place, which should be constantly kept clear from Weeds; and when their Pods are ripe, they should be gathered and preserved in a dry Place till the following Spring, in order to be sown.

The 1st Sort is the best worth cultivating, the Pods being large and more visible than the other, and more in Form of a Caterpillar.

SCORZONERA Tourn. Inst. R. H. 476. Tab. 269. Lin. Gen. Pl. 811. Viper-grass; in French, *Scorzonere*.

The Characters are,

The common Empalement is scaly, cylindrical, and imbricated. The Flower is composed of several hermaphrodite Florets, those on the Outside being the longest; they are narrow, Tongue-shaped, and indented in 5 Parts. They have 5 short Hair-like Stamina, terminated by cylindrical Summits. The Germen is situated under the Floret, supporting a slender Style crowned by 2 reflexed Stigmas. The Germen turns to a single, oblong, channelled, Seed, crowned with feathery Down.

The Species are,

1. *SCORZONERA foliis infimis sinuato-dentatis, caulibus linearibus semiamplexicaulibus.* *Scorzonera* with lower Leaves indented, and those on the Stalks linear and half embracing them with their Base. *Scorzonera latifolia, sinuata. C. B. P. 275.* Viper-grass with broad sinuated Leaves.

2. *SCORZONERA caule ramoso, foliis nervosis planis integerrimis.* *Scorzonera* with a branching Stalk, and veined, plain, entire Leaves. *Scorzonera latifolia altera. C. B. P. 275.* Another broad-leaved Viper-grass.

3. *SCORZONERA caule subnudo unifloro, foliis nervosis planis.* *Hort. Cliff. 382.* *Scorzonera* with an almost naked Stalk having 1 Flower, and plain veined Leaves. *Scorzonera humilis latifolia nervosa. C. B. P. 275.* Dwarf Viper grass, with broad veined Leaves.

4. *SCORZONERA foliis lineari-ensiformibus integris cernatis*

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vinatis. Lin. Sp. Pl. 791. *Scorzonera* with linear, Sword-shaped, entire Leaves, which are keeled. *Scorzonera Lusitanica*, *gramineo folio*, *flore pallide luteo*. Tourn. Inst. 477. Portugal Viper-grass with a Grass Leaf, and a pale yellow Flower.

5. *SCORZONERA foliis linearibus subulatis integris planis, pedunculis cylindricis*. Lin. Sp. Pl. 791. *Scorzonera* with linear, Awl-shaped, entire plain Leaves, and cylindrical Foot Stalks. *Scorzonera angustifolia subcaerulea*. C. B. P. 275. Narrow-leaved Viper-grass, with a Flower almost blue.

6. *SCORZONERA foliis subulatis integris, pedunculo in- crassato, caule basi villosa*. Lin. Sp. Pl. 791. *Scorzonera* with Awl-shaped entire Leaves, a thick Foot Stalk, and the Stalk hairy at its Base. *Scorzonera humilis, angustifolia pannonica*. Clus. Hist. 2. p. 137. Low, narrow-leaved, Hungarian Vipers-grass.

7. *SCORZONERA foliis linearibus multifidis, caule erecto*. *Scorzonera* with narrow, many pointed Leaves, and an erect Stalk. *Scorzonera laciniatis foliis*. Tourn. Inst. 477. Vipers-grass with cut Leaves.

8. *SCORZONERA foliis linearibus pinnatifidis, caulibus procumbentibus*. *Scorzonera* with narrow, many-pointed Leaves, and trailing Stalks. *Scorzonera foliis laciniatis supina*. Bocc. Barb. Ind. alt. 1. 89. Low Viper-grass with cut Leaves.

The 1st is the Sort commonly cultivated in the English Gardens for Food and Physick; this grows naturally in Spain. The Root of this Plant is Carrot-shaped, about the Thickness of a Finger, and covered with a dark brown Skin; it is white within, and has a milky Juice; the lower Leaves are 9 or 10 Inches long, and one and a Half broad in the Middle, ending with a long acute Point, they are waved and sinuated at their Edges. The Stalk rises 3 Feet high, it is smooth, branching at the Top, and garnished with a few narrow Leaves, whose Base half embrace the Stalk. The Flowers grow on the Top of the Stalks in scaly Empalements, composed of many narrow, Tongue-shaped, hermaphrodite Florets, lying Imbricatum over each other, like the Scales on Fish; they are of a bright yellow Colour, and appear in June and July. After these are decayed, the Germen which sits in the common Empalement, turns to oblong cornered Seeds, having a roundish Ball of feathery Down at the Top.

The 2d Sort is like the first, but the Leaves are broader, entire, and more veined; the Stalk does not rise so high, and Branches more.

The 3d Sort is shorter than either of the Former; the Leaves are broader, the Stalk is almost naked, and has one yellow Flower at the Top.

The 4th Sort has narrow, keeled, Sword-shaped Leaves; the Stalks are slender, they rise about 2 Feet high, branch toward the Top, and sustain pale yellow Flowers, smaller than those of the former Sorts.

The 5th Sort has narrow Awl-shaped Leaves, shorter than those of the former; the Stalk is taper, and branches at the Top; the Flowers are of a pale purple Colour.

The 6th Sort grows a Foot and a Half high; the Leaves are narrow and Awl-shaped; the Foot Stalk immediately under the Flower is thicker than below, and the lower Part of the Stalk is hairy; the Flower is yellow.

The 7th Sort rises with a smooth branching Stalk 2

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Feet high, garnished with narrow Leaves having many winged Points, resembling those of Buckhorn Plantain, but larger. The Flowers are yellow, and stand on long naked Foot Stalks at the End of the Branches.

The 8th Sort is exactly like the 7th in every Respect, except that the Stalks spread on the Ground; which is not accidental, for I have cultivated both Sorts above 30 Years, and have never found either of them alter.

The 1st Sort only is cultivated for Use, the others are preserved in Botanick Gardens for Variety, but are seldom admitted into other Gardens.

These Plants may be propagated by sowing their Seeds the Beginning of April, on a Spot of light fresh Soil. The best Method of sowing them is, to draw shallow Furrows by a Line about a Foot asunder, into which you should scatter the Seeds, thinly covering them over about half an Inch thick, with the same light Earth; and when the Plants are come up, they should be thinned where they are too close in the Rows, leaving them at least 6 Inches a sunder; and at the same Time, you should hoe down all the Weeds to destroy them; and this must be repeated as often as is necessary, for if the Weeds are permitted to grow among the Plants, they will draw them up weak.

There are many People who sow these Seeds promiscuously in a Bed, and afterward transplant them out at the Distance they would have them grow; but this is not so well as the former Method, because their Roots commonly shoot downright, which, in being transplanted, are often broken, so that they never will make such fair Roots as those which remain in the same Place where they are sown; for when the extreme Part of the Root is broken, it never extends itself in Length afterwards, but only shoots out into many forked small Roots, which are not near so valuable as those which are large and strait. These Roots may be taken up when the Leaves begin to decay, at which Time they have done growing, though they may remain in the Ground until Spring, and may be taken up as they are used; but those which remain in the Ground after March, will shoot up their Flower Stems, after which they are not so good, being sticky and strong.

If you intend to save Seeds of these Plants, you should let a Parcel of the best remain in the Places where they grew; and when their Stems are grown to their Height, they should be supported with Stakes, to prevent their falling to the Ground, or breaking. In June they will flower, and about the Beginning of August their Seeds will ripen, when they should be gathered, and preserved dry till Spring following, for Use.

SCROPHULARIA. Tourn. Inst. R. H. 166. Tab. 74. Lin. Gen. Pl. 674. Figwort; in French, *Scrofulaire*.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, cut into 5 Parts at the Top. It hath 1 unequal Petal, with a large globular Tube. The Brim is cut into 5 small Parts; the 2 upper are large and erect, the 2 Side ones spread open, and the under is reflexed. It has 4 slender deflexed Stamina, 2 the Length of the Petal, and 2 shorter, terminated by Twin Summits; and an oval Germen, supporting a single Style the Length of the Stamina, crowned by a single Stigma. The Germen turns to a roundish pointed

printed Capsule with 2 Cells, which open at Top, and are filled with small Seeds.

The Species are,

1. *SCROPHULARIA foliis cordatis basi transversis, caule obtusangulo. Lin. Sp. Pl. 619.* Figwort with Heart-shaped Leaves, whose Bases are transverse, and a Stalk having obtuse Angles. *Scrophularia nodosa foetida. C. B. P.* Figwort with a knobby Root and a stinking smell.

2. *SCROPHULARIA foliis cordatis petiolatis decurrentibus, caule acutangulo, racemis terminalibus. Hort. Ups.* 177. Figwort with Heart-shaped Leaves having running Foot Stalks, and an angular membranaceous Stalk, terminated by a Racemus of Flowers. *Scrophularia aquatica major. C. B. P. 236.* Greater Water Figwort, by some called Water Betony.

3. *SCROPHULARIA foliis cordato-oblongis, basi appendiculatis, racemis terminalibus. Læf. Lin. Sp. Pl. 620.* Figwort with oblong Heart-shaped Leaves, having Appendages at their Base, and Stalks terminated by a Racemus of Flowers. *Scrophularia aquatica, flore sulphureo. Michel.* Water Figwort with a Brimstone-coloured Flower.

4. *SCROPHULARIA foliis cordato-sagittatis, acutè serratis, racemis terminalibus. Scrophularia* with Heart-shaped, Arrow-pointed Leaves, acutely sawed, and Stalks terminated by a Racemus of Flowers. *Scrophularia betonica folio. Tourn. Inst. R. H. 166.* Figwort with a Betony Leaf.

5. *SCROPHULARIA foliis cordatis serratis, superioribus alternis, racemis axillaribus, pedunculis bifloris.* Figwort with Heart-shaped sawed Leaves, those on the upper Part placed alternately, and Bunches of Flowers proceeding from the Wings of the Stalk, with 2 Flowers on a Foot Stalk. *Scrophularia melissæ folio. Tourn. Inst. R. H. 166.* Figwort with a Baum Leaf.

6. *SCROPHULARIA foliis cordatis duplicato-serratis, racemo composito. Flor. Leyd. Prod. 296.* Figwort with Heart-shaped doubly-sawed Leaves, and compound Bunches of Flowers. *Scrophularia nemorensis, folio urticae rugoso, flore atro punicante. Hort. Catb.* Wood Figwort with a rough Nettle Leaf, and a dark red Flower.

7. *SCROPHULARIA foliis difformibus, pedunculis axillaribus aggregatis. Flor. Leyd. Prod. 292.* Figwort with difformed Leaves, and Foot Stalks of Flowers gathered together at the Wings of the Stalk. *Scrophularia Hispanica, sambuci folio glabro. Tourn. Inst. 166.* Spanish Figwort with a smooth Elder Leaf.

8. *SCROPHULARIA foliis difformibus laciniatis villosis, racemis compositis axillaribus.* Figwort with difformed, cut, hairy Leaves, and compound Bunches of Flowers at the Wings of the Leaves. *Scrophularia maxima Lusitanica, sambuci folio lanuginoso. Tourn. Inst. 167.* Greatest Portugal Figwort, with a woolly Elder Leaf.

9. *SCROPHULARIA foliis inferioribus pinnatis, summis integris duplicato-serratis, racemis axillaribus.* Figwort with the lower Leaves winged, those at the Top entire, doubly sawed, and Bunches of Flowers at the Wings of the Stalk. *Scrophularia ruta canina dicta vulgaris. C. B. P. 236.* Common Figwort, called Dogs-rue.

10. *SCROPHULARIA foliis pinnatis, foliolis acutè dentatis, racemis terminalibus.* Figwort with winged Leaves, whose Lobes are acutely indented, and Bunches of Flowers terminating the Stalk. *Scrophularia folio filicis modo laciniatis, vel ruta canina latifolia. C. B. P. 236.*

Figwort with Leaves cut like Fern, or broad-leaved Dogs-rue.

11. *SCROPHULARIA foliis linearibus pinnatis lucidis crassis, foliolis pinnatifidis racemis terminalibus.* Figwort with linear winged Leaves thick and shining, Wing-pointed Lobes, and Stalks terminated by Bunches of Flowers. *Scrophularia saxatilis lucida, laserpitii Massiliensis foliis. Bocc. Mus. p. 2. 166.* Shining Rock Figwort, with Leaves like Laserwort of Marseilles.

12. *SCROPHULARIA foliis lanceolato-linearibus acutè serratis, infernè incisis, racemo composito. Flor. Leyd. Prod. 294.* Figwort with linear Spear-shaped Leaves sharply sawed and cut beneath, and a compound Bunch of Flowers. *Scrophularia Orientalis, foliis cannabinis. Tourn. Cor. 9.* Eastern Figwort with Leaves like Hemp.

13. *SCROPHULARIA foliis cordatis, pedunculis axillaribus solitariis dichotomis. Hort. Cliff. 322.* Figwort with Heart-shaped Leaves, and single Foot Stalks proceeding from their Wings, and divided by Pairs. *Scrophularia flore luteo. C. B. P. 236.* Figwort with a yellow Flower.

14. *SCROPHULARIA foliis cordatis, superioribus alternis, pedunculis axillaribus bifloris. Hort. Cliff. 322.* Figwort with Heart shaped Leaves, the upper of which are alternate, and Foot Stalks proceeding from the Wings of the Stalks, and bearing two Flowers. *Scrophularia urticae folio. C. B. P. 236.* Figwort with a Nettle Leaf.

15. *SCROPHULARIA foliis pinnatis, foliolis incisis, racemis simplicissimis terminalibus.* Figwort with winged Leaves whose Lobes are cut, and single Bunches of Flowers terminating the Stalks. *Scrophularia Orientalis, corysanthemi folio, flore minimo variegato. Tourn. Cor. 9.* Eastern Figwort with a Corn Marygold Leaf, and the least variegated Flower.

16. *SCROPHULARIA foliis ovatis lanceolatis dentatis, racemis terminalibus.* Figwort with oval, indented, Spear-shaped Leaves, and Bunches of Flowers terminating the Stalks.

17. *SCROPHULARIA foliis cordatis serratis acutis basi rotundatis, caule obtusangulo. Hort. Upsal. 177.* Figwort with Heart-shaped, acute, sawed Leaves, rounded at their Base, and obtuse Angles to the Stalks. *Scrophularia Marylandica, longo profunde serrato urticae folio. Raii. Suppl. 396.* Maryland Figwort with a long Nettle Leaf which is deeply sawed.

18. *SCROPHULARIA foliis ovatis obovatis serratis ternis caulem ambientibus, floribus corymbosis terminalibus.* Figwort with oval, acute-pointed sawed Leaves, placed by Threes round the Stalk, and Flowers in round Bunches terminating the same. *Scrophularia flore coccineo, foliis urticae ternis caulem ambientibus. Houst. Mss.* Figwort with a scarlet Flower, and Leaves like those of the Nettle placed by Threes round the Stalk.

The 1st Sort grows naturally in the Woods and under Hedges, in most Parts of England, so is seldom admitted into Gardens; but being a medicinal Plant, it is here mentioned to introduce the others. This hath a spreading Root composed of many whitish Knobs, from which arise several 4-cornered Stalks, 3 Feet high, garnished with Heart-shaped Leaves sawed on their Edges, having their Bases transverse; they are placed by Pairs, and are of a dark green, or brownish Colour on their upper Side, but pale on their under, having an Odour

of Elder. The Flowers are produced in small Clusters from the Sides of the Stalks opposite, forming a Kind of loose Spike to the Top; they are of one Petal, of a dark purple Colour, and shaped almost like a Lip Flower; the upper Lip or Crest being a little arched, the two Side Segments spread open, and the under Segment is recurved. These appear in *June*, and are succeeded by roundish Capsules ending in acute Points, having two Cells filled with small Seeds, which ripen in *August*.

The 2d Sort grows naturally by the Side of Ditches and watery Places in every Part of *England*; this has a fibrous Root, sending out strong four-cornered Stalks, which grow near 4 Feet high, garnished with Heart-shaped Leaves, rounded at their Points and crenated on their Edges, somewhat like those of Betony, from whence it has been titled Water Betony. The Flowers are larger than those of the former, and are a little redder, but of the same Shape, and appear at the same Time. This Sort is sometimes used in Medicine, but as it grows wild in common, is seldom admitted into Gardens. There is a Variety of this with variegated Leaves, which is by some preserved in Gardens.

The 3d Sort grows naturally in *Italy* and *Spain*, by the Sides of Rivers and other moist Places. The Stalks of this are stronger, taller, and greener, than those of the former; the Leaves have generally small Appendages at their Base; the Flowers are greener, and grow thinner upon the Stalks, than those of the former, and in these Particulars consist their Differences.

The 4th Sort grows naturally in *Sicily*; this has a perennial fibrous Root. The Stalks rise near 4 Feet high, and have sharp Angles; the Leaves are Arrow-pointed, Heart-shaped, and are sharply sawed on their Edges; the Flowers grow in loose Bunches to the Top of the Stalks; they are in Shape like those of the former, but are of a dark red Colour.

The 5th Sort grows naturally in *Italy*; it has a perennial Root. The Stalks rise 4 Feet high, and branch out on their Side; they are garnished with Heart-shaped sawed Leaves, which on the upper Part of the Stalk are placed alternate. The Flowers are produced in Bunches at the Wings of the Stalk, each Foot Stalk supporting two Flowers; these are small, of a brown Colour, and appear in *June*. The Seeds ripen in *August*.

The 6th Sort grows naturally in *Sicily*; this has a perennial Root. The Stalks rise four Feet high, and are garnished with Heart-shaped Leaves doubly sawed on their Edges; the Flowers are disposed in compound Spikes, which sit on long Foot Stalks; these arise from the Wings of the Stalks, and have generally two narrow Leaves placed at their Base, but the Flowers terminate the Stalks like the 3 first Sorts.

The 7th Sort grows naturally in *Spain*; this has a perennial Root. The Leaves at the Bottom are irregularly cut, and have two Appendages at their Base; they are smooth, of a lucid green, and sawed on their Edges. The Stalks rise 4 Feet high; they are four-cornered, smooth, and garnished with oval Leaves, some of which are entire, and others have small Lobes or Appendages at their Base. The Flowers grow from the Wings of the Stalks in Clusters, each standing on a separate Foot Stalk; they are of a bright red Colour with green-

ish Bottoms, and are much larger than either of the former. It flowers the Beginning of *June*, and the Seeds ripen in *August*.

The 8th Sort grows naturally in *Portugal*; this resembles the 7th, but the Stalks are larger, rise higher, and are hairy. The Leaves are much longer, and have 4 Appendages; they are hairy, and irregularly sawed on their Edges, running out into longer Points; the Flowers grow in compound Bunches at the Wings of the Stalks; they are larger than those of the former Sort, and have a greater Mixture of green in them.

The 9th Sort grows naturally in *Italy*; this has a Root composed of a few thick fleshy Fibres. The Stalks are slender, four-cornered, and rise about 2 Feet high; the lower Leaves are composed of several Pinnæ or Lobes which are sharply sawed, but those on the Stalks are entire and sharply sawed; on the lower Part of the Stalk they are placed opposite, but toward the Top they are alternate and small. The Flowers come out in Bunches from the Wings of the Stalk; they are small, and of a dark purple Colour with a Mixture of green; the Seed Vessels are small and roundish. This flowers the same Time with the former.

The 10th Sort grows naturally in *Crete*; this hath a Root composed of fleshy Fibres. The lower Leaves are broad and jagged, not much unlike those of the *Indian Scabious*; the Stalks rise near 3 Feet high; they are four cornered, green, and smooth, and garnished with winged Leaves having very long Foot Stalks; they are composed of 2 or 3 Pair of small Lobes, terminated by 1 large one, which are acutely indented on their Edges, and end in sharp Points. The Stalks are terminated by slender Bunches of Flowers situated sparsely; they are small, of a purplish Colour at their Rims, and edged with white; these are succeeded by small roundish Seed Vessels filled with very small Seeds. It flowers in *June*, and the Seeds ripen in *September*.

The 11th Sort grows naturally in the Kingdom of *Naples*, where it is frequently found on Rocks and old Stone Walls; this is a biennial Plant, which perishes after it has produced ripe Seeds. The Stalks rise 15 Inches high; they are thick, smooth, and have scarce any Corners; the Leaves are winged, narrow, and of a lucid green; they are thick, succulent, and divided into many small Lobes which are again divided, and are Wing pointed; the Flowers are produced in loose Bunches on the Sides and at the Top of the Stalk; they are of a dark brown Colour, with a Mixture of green, and are succeeded by pretty large roundish Capsules filled with angular dark-coloured Seeds. It flowers about the same Time as the former Sort.

The 12th Sort grows naturally in the *Levant*; this has a perennial creeping Root. The Stalks rise two Feet and a Half high; their lower Parts are closely garnished with narrow Spear-shaped Leaves sharply sawed, and cut at the Bottom; the upper Part of the Stalk is garnished with compound Bunches of small brown Flowers which appear in *May*, and are succeeded by small roundish Capsules filled with small Seeds which ripen in *July*.

The 13th Sort grows naturally in *Helvetia*; this is a biennial Plant which flowers and produces Seeds the second Year, and then decays. The lower Leaves

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of this Sort are 4 or 5 Inches long and three broad; they are Heart-shaped, hairy, and of a pale green Colour. The Stalks rise 3 Feet high, and are garnished with smaller Leaves, of the same Shape with those at Bottom, placed by Threes round the Stalk; the Flowers stand on pretty long Foot Stalks; 3 of these come out at each Joint round the Stalk, and support Clusters of pretty large Flowers of a pale yellow Colour; these appear in April, and are succeeded by oval Capsules filled with small Seeds which ripen in June.

The 14th Sort is a biennial Plant which grows naturally in Italy. The Leaves of this are Heart-shaped, ending in acute Points, and are sawed on their Edges; they are of a lucid green, and on the upper Part of the Stalk are placed alternate; the Foot Stalks of the Flowers come out at the Wings of the Leaves; these do each sustain 2 or 3 Flowers of a dark red or purple Colour; they appear in May and June, and the Seeds ripen in July and August, after which the Plants die.

The 15th Sort grows naturally in the Levant, and also on Gibraltar Hill; this is a biennial Plant, dying soon after the Seeds are ripe. The lower Leaves of this Sort are doubly winged, and the small are variously cut and indented; the Stalk is slender, and rises 3 Feet high, the lower Part of which is garnished with smaller winged Leaves, of a lucid green, which are indented, and sit close to the Stalks; the upper Part has very slender Bunches of small Flowers coming out of the Side to the Top. The Flowers are thinly ranged on the Foot Stalks; they are very small, and of a purple Colour with white Borders; these appear in June and July, but, unless the Autumn proves warm, they will produce no good Seeds in England.

The Seeds of the 16th Sort were sent me from Zant; this is also a biennial Plant. The Stalks are four-cornered, and rise 2 Feet high, sending out several small Side Branches; the Leaves are oval, Spear-shaped, about 2 Inches long, and three Quarters of an Inch broad in the Middle, and rounded at both Ends; they are indented on their Edges, and stand on pretty long Foot Stalks. The upper Part of the Stalk is garnished with slender Bunches to the Top, which are very small, of a bright purple Colour, and will appear in July; but, unless the Autumn is warm, the Seeds will not ripen in England.

The 17th Sort grows naturally in Maryland; this hath a perennial fibrous Root. The Stalks are four cornered; the Leaves are Heart-shaped, sharply sawed on their Edges, and rounded at their Base; the Flowers are produced in Bunches on the upper Part of the Stalk, and are like those of the first Sort, but of an herbaceous Colour. This flowers in June and July, and the Seeds ripen in Autumn.

The 18th Sort was discovered growing naturally at La Vera Cruz in New Spain; that is a biennial Plant. The Stalk rises 2 Feet high, and is garnished with oval acute-pointed Leaves sawed on their Edges, and sitting close to the Stalks; those at the Bottom and Top of the Stalk are placed by Pairs, but in the Middle there are 3 Leaves at each Joint placed round the Stalk; they are of a pale green Colour, and at the Top of the Stalk the Flowers are produced in roundish Bunches; they are about the Size of those of the first Sort, and are of a

fine scarlet Colour. This Sort flowered in the Chelsea Garden, but did not perfect its Seeds.

These Plants are propagated by Seeds, which if sown in the Spring, the Plants seldom rise the same Season. Some of them may come up in Autumn, and others the Spring following; but, if they are sown in Autumn, soon after they are ripe, the Plants will come up the Spring following. These Seeds may be sown in the Place where the Plants are to remain, for the Plants are all of them hardy enough to bear the Cold of our ordinary Winters in the open Air (except the last Sort which is tender.) When the Plants come up, they will require no other Care but to thin them where they are too close, and keep them clear from Weeds. The second Year the Plants will flower and produce ripe Seeds; after which those Sorts which are biennial will die, but the others will continue some Years.

The 7th and 8th Sorts are ornamental Plants, so may be allowed to have a Place in the Pleasure Garden, where, when the Plants are strong, they will make a good Appearance during their Continuance in flower, which generally lasts two Months, unless the Season proves very hot and dry. The Roots of these Sorts will abide some Years, unless by a very severe Winter they are destroyed; but, as young Plants flower stronger than the old ones, there should be a Succession of them annually propagated by Seeds.

The other Sorts are proper Furniture for Botanic Gardens, but are seldom cultivated in any other. The 9th, 10th, 11th, and 16th Sorts should have a dry Soil, for, as they naturally grow on Rocks and old Walls, if they are in good Ground, the Plants will grow vigorous in Summer, and be so replete with Moisture, as to be killed by ordinary Frosts, or rot with Wet in Winter, whereas in a poor dry Soil they are seldom injured by the Cold in England.

The last Sort is too tender to live through the Winter in the open Air in this Country, but the Seeds should be sown in Pots in Autumn, which may be sheltered under a common Frame in Winter, and in the Spring plunged into a moderate hot Bed, which will bring them up. When these are fit to remove, as many of them as are required should be planted into separate small Pots, and plunged into a very moderate hot Bed, shading them from the Sun till they have taken new Root; after which they must be gradually hardened to bear the open Air, into which they may be removed the latter End of June, placing them in a sheltered Situation, where they may remain till September, when they should be removed into Shelter before any Morning Frosts come on, and in Winter they must be placed in a Stove, kept moderately warm, where they will thrive and produce Flowers the following Summer.

SCUTELLARIA. Lin. Gen. Pl. 653. *Cassida*. Tourn. Inst. R. H. 181. Tab. 84. Skull-cap; in *Fremb*, *La Toque*.

The Characters are,

The Flower has a very short tubulous Empalement of 1 Leaf, whose Brim is entire, having an incumbent scaly Operculum which seems closed; it is of the Lip Kind, with a very short crooked Tube, long compressed Chaps, and a concave trifid upper Lip, the middle Segment being concave and indented, the two Side ones plain. The under Lip

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Lip is broad and indented; it has 4 Stamina hid under the upper Lip, 2 of which are longer than the other, terminated by small Summits, and a four-pointed Germen, supporting a slender Style situated with the Stamina, crowned by a single recurved Stigma. The Empalement becomes a Helmet-shaped Capsule including four Seeds which are roundish.

The Species are,

1. *SCUTELLARIA foliis subcordatis serratis, spicis interruptis.* Hort. Cliff. 317. Skull-cap with almost Heart-shaped sawed Leaves, and interrupted Spikes of Flowers. *Cassida Col. Ecpb. 1. 187.* Skull-cap.

2. *SCUTELLARIA foliis cordatis obtusis obtusèque serratis, spicis foliosis.* Prod. Leyd. 311. Skull-cap with obtuse Heart-shaped Leaves bluntly sawed, and leafy Spikes of Flowers. *Cassida Cretica fruticosa, catariae folio flore albo.* Tourn. Cor. 11. Shrubby Cretan Skull-cap with a Cat-mint Leaf and a white Flower.

3. *SCUTELLARIA foliis cordato-oblongis acuminatis serratis, spicis subnudis.* Lin. Sp. Pl. 600. Skull-cap with oblong, acute-pointed, Heart-shaped, sawed Leaves, and almost naked Spikes of Flowers. *Cassida orientalis altissima, urticae folio.* Tourn. Cor. 11. Tallest eastern Skull-cap with a Nettle Leaf.

4. *SCUTELLARIA foliis incisiss, subius tomentosis.* Hort. Upsal. 173. Skull-cap with cut Leaves woolly on their under Side. *Cassida orientalis Chamædryos folio, flore luteo.* Tourn. Cor. 11. Eastern Skull-cap with a Germander Leaf and a yellow Flower.

5. *SCUTELLARIA foliis ovatis sessilibus, interioribus obsolete serratis, superioribus integerrimis.* Lin Sp. Pl. 599. Skull-cap with oval Leaves sitting close to the Stalks, the under of which are sometimes sawed, and the upper entire. *Cassida folio melissæ, flore purpureo, longiore.* Boerb. Ind. alt. 1. 177. Skull-cap with a Baum Leaf and a longer purple Flower.

6. *SCUTELLARIA foliis inciso-serratis utrinque glabris, spicâ rotundato-tetragonâ.* Hort. Upsal. 173. Skull-cap with sawed cut Leaves smooth on both Sides, and a roundish four-cornered Spike of Flowers. *Cassida Alpina supina, magno flore.* Tourn. Inf. R. H. 182. Low Alpine Skull-cap with a large Flower.

There are some other Species of this Genus, which are Plants of little Beauty, so are seldom admitted into Gardens, for which Reason they are not enumerated here.

The 1st Sort grows naturally in Italy. Mr. Ray observed it about Legborn and Florence, in the Hedges and uncultivated Places in Plenty; this hath a perennial Root. The Stalk is four-cornered, hairy, and rises 2 Feet high; it is garnished with Leaves placed opposite, almost Heart-shaped and sawed on their Edges. The Flowers grow in interrupted Spikes at the Top of the Stalks; they are of a purple Colour in some, and in others they are white; these appear in June, and, after they decay, the Empalement, which represents a Helmet, contains four roundish Seeds which ripen in August.

The 2d Sort grows naturally in Crete; this hath a ligneous Stalk, which rises about 2 Feet high, sending out slender Side Branches, garnished with obtuse Heart-shaped Leaves, bluntly sawed on their Edges; they are hoary on their under Side, and of a light green on their upper. The Flowers are disposed in pretty long Spikes at the Top of the Stalks; they are white, and have

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small Leaves growing between them. This flowers in July, and the Seeds ripen in Autumn.

The 3d Sort grows naturally in the Levant; this hath a perennial Root. The Stalks rise from 3 to 4 Feet high, sending out a few slender Branches from their Sides; they are garnished with oblong Heart-shaped Leaves, ending in acute Points, sawed on their Edges. The Flowers are disposed in naked Spikes at the Top of the Stalks; they are purple, and have longer Tubes than any of the other Sorts. This flowers about the same Time as the former.

The 4th Sort grows naturally in the Levant; this is a perennial Plant, with shrubby Stalks which spread on the Ground; these divide into small Branches garnished with cut Leaves placed opposite; these are almost triangular, of a light green on their upper Side, and downy on their under, standing on slender Foot Stalks. The Flowers are disposed in short Spikes at the End of the Branches; they are of a bright yellow Colour, and are succeeded by gray Seeds which ripen in the Empalement. This Plant begins to flower the latter End of May, and there is commonly a Succession of Flowers on the same Plant upward of two Months.

The 5th Sort grows naturally in North America; it has a perennial Root, from which come forth several four-cornered Stalks, two Feet high, sending out many Side Branches. The lower Leaves are Heart-shaped and sawed one their Edges, standing on pretty long Foot Stalks; the upper Leaves are oval and entire. The Flowers are disposed in very long loose Spikes at the End of the Branches; they are of a blue Colour, and appear the latter End of June; these are succeeded by Seeds which ripen in September.

The 6th Sort grows naturally on the Alps and Apennines. The Stalks of this are shrubby and trailing; the Leaves are cut on their Edges, and smooth on both Sides; the Flowers are disposed at the Top of the Stalks in roundish four-cornered Spikes; in one they are white, and in another Variety they are blue; they are larger than the Flowers of any other known Species, so make a pretty Appearance in Gardens. This flowers in June, July, and August, and the Seeds ripen in Autumn.

These Plants are all propagated by Seeds. If these are sown in Autumn soon after they are ripe, they will more certainly succeed than when sown in the Spring, for these sometimes miscarry, and, if they succeed, the Plants seldom come up the same Season. The Seeds may either be sown where the Plants are to remain, or in a Border to be afterward removed, but, as the fourth Sort does not bear transplanting well, unless removed young, the Seeds of that had better be sown where the Plants are to stand. This should be on a dry warm Border of poor Earth, where the Plants will live much longer, and make a better Appearance than on a rich Soil. When they come up, they require no other Care but to thin them, and keep them clean from Weeds.

When the other Sorts come up, and are fit to remove, they may be transplanted into a Nursery Bed at five or six Inches Distance where they may stand till Autumn, but must be kept clean from Weeds during that Time; then they may be transplanted into the Borders of the Flower Garden where they are to remain.

As these Plants are not of long Duration, it will be proper

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proper to sow a Succession of Seeds every other Year at least, to supply the Places of those which decay.

SECALE. Tourn. Inst. R. H. 513. Tab. 294 Lin. Gen. Pl. 92. Rye; in French, Sègle.

The Characters are,

There are 2 Flowers in each Involucrum; they have 2 Leaves which are opposite, narrow, erect, and sharp-pointed. The Petals have 2 Leaves; the outer Valve is rigid, bellied, acute-pointed, and compressed; the lower Border is hairy, ending in a long Awk; the inner is plain and Spear-shaped; they have 2 oval erect Nectaria and 3 Hair-like Stamina, hanging without the Flower, terminated by oblong forked Summits, with a Top-shaped Germen supporting 2 reflexed hairy Styles, crowned by a single Stigma. The Germen becomes an oblong almost cylindrical Seed which ripens in the Empalement.

We have but one distinct Species of this Genus cultivated in England, though it is often supposed the two Varieties are essentially different, but, from several Years cultivating them on the same Land, I could find no real Difference between them. Dr. Linnæus titles this *Secale glumarum ciliis scabris*. Hort. Upsal. 22. Rye with rough Hairs to the Awns. This is the *Secale hybernium vel majus*. C. B. P. 23. Winter or greater Rye.

The Farmers distinguish the 2 Varieties by the Titles of Winter and Spring Rye, but when these are sown 3 or 4 Years, at the same Season, and on the same Soil, it will be difficult to know them asunder; but, where Rye is sown on warm Land, it will ripen much earlier than on cold stiff Ground, and by continuing it two or three Years, it will be forwarded so much, as to ripen a Month earlier than the Seeds which have long grown on a strong cold Soil, so those, who are obliged to sow Rye toward Spring, generally provide themselves with this early Seed.

There are several Kinds of Grass, now ranged under this general Title, but, as they do not merit Cultivation, I shall not trouble the Reader with them here.

Rye is so well known to every one the least acquainted with the different Grains, as to need no Description.

The Winter Rye is what the Generality of Farmers propagate; it is usually sown in Autumn at the same Season with Wheat, and in many of the northern Countries, and in Wales, they are often mixed together, though I think it must be very bad Husbandry, for the Rye will always ripen sooner than Wheat, so that, if the latter is permitted to be fully ripe, the former will shatter; nor can this be practised where the People are not accustomed to eat Rye Bread; for although it is by some accounted good when mixed, yet being so very clammy, few People, who have been fed with Wheat, will ever care to eat the Bread made of it.

It is generally sown on poor, dry, gravelly, or sandy Land, where Wheat will not thrive, and in such Places may answer very well; but on such Land as will bear Wheat, it is not proper to sow Rye as its Value is greatly inferior to that of Wheat.

When Rye is sown, the Ground should not be too wet; and if much Rain falls before the Rye is come up, it often rots in the Ground; but it is not long coming up, it being much sooner out of the Ground than Wheat.

The small Rye may be sown in the Spring, the same Time with Oats, and it will be ripe as soon as the other

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Sort; but if the Season proves wet, it is apt to run much to Straw; and the Grain is generally lighter than the other, so the only Use of this Sort is to sow on Lands where the autumnal Crop may have miscarried.

The general Use of Rye is for Bread, either alone, or mixed with Wheat, but (as was before observed) it is only fit for such Persons who have always been used to it, few other Persons caring to eat of it; nor have I ever heard of its having been exported, so can never be worth cultivating in general, though I have been informed it will yield a strong Spirit, which perhaps may occasion its being more cultivated, since the pernicious Use of Spirituous Liquors is now tolerated.

Rye is also sown in Autumn to afford green Feed for Ewes and Lambs in Spring, before there is Plenty of Grass. When this is intended, the Rye should be sown early in Autumn that it may have Strength to furnish early Feed. The great Use of this is to supply the Want of Turnips in those Places where they have failed, as also, after the Turnips are over, and before the Grass is grown enough, to supply green Feed for the Ewes, so that in those Seasons, when the Turnips in general fail, it is very good Husbandry to sow the Land with Rye, especially where there are Stocks of Sheep, which cannot be well supported, where green Feed is wanting early in the Spring; therefore those Farmers, who have large live Stocks, should have several Methods of supplying themselves with sufficient Feed, lest some should fail; for as Turnips are a very precarious Crop, some Land should be sown with Cole Seed, which will supply the Want of Turnips in Winter; and, if some of the Ground, which was sown late with Turnips which had failed, was sown in Autumn with Rye, it would be fit to supply the Want of Cole Seed afterward.

SECURIDACA. Tourn. Inst. R. H. 399. Tab. 224. Coronilla. Lin. Gen. 789. Hatched-vetch.

The Characters are,

The Empalement of the Flower is short, compressed, and of 1 Leaf cut into 2 Segments which are erect. The Flower is of the Butterfly Kind; the Standard is Heart-shaped, reflexed on both Sides, and scarce longer than the Wings; these are oval, joining at Top, but open at Bottom; the Keel is compressed and pointed. It hath 10 Stamina, nine joined, and one separate, terminated by small Summits, and an oblong compressed Germen, with a bristly Style, crowned by an obtuse Stigma. The Germen turns to a long compressed Sword-shaped Pod, with a thick Border on one Side, plain on the other, opening in two Cells filled with square Seeds.

We have but one Species of this Genus at present, which is the *Securidaca herbacea*, *leguminibus falcato-glabriatis*. Herbaceous Hatched-vetch with hooked Sword-shaped Pods.

This Plant grows naturally in the Corn Fields in Spain and Italy; it is annual, and perishes soon after the Seeds are ripe; it hath trailing herbaceous Stalks which grow a Foot and a Half long, and divide into many Branches which spread on the Ground, garnished with winged Leaves composed of 7 or 8 Pair of oval obtuse Lobes terminated by an odd one; they are of a deep green and smooth. From the Wings of the Leaves arise the Foot Stalks of the Flowers; these come out by Pairs opposite at each Joint, are 5 or 6 Inches long,

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long, sustaining at the Top a large Cluster of yellow Flowers of the Butterfly Kind; these are succeeded by compressed Pods near 4 Inches long, ending in acute Points; they have a Suture on each Side, one plain, and the other rising and thick; they are joined at their Base to the Foot Stalk, but spread open like the Rays of a Star, and are divided by a longitudinal Partition into 2 Cells, each containing a Row of square flat Seeds of a reddish Colour. This Plant flowers in July, and the Seeds ripen in Autumn.

It is propagated by sowing the Seeds in Borders of light fresh Earth in Spring, in the Places where the Plants are to abide, for they seldom succeed well if transplanted; they should be allowed at least 2 Feet Distance, because their Branches trail on the Ground. When the Plants come up, they will require no other Care, but to thin them where too close, and keep them clean from Weeds. A few of these Plants may be admitted into every good Garden for Variety, though there is no great Beauty in their Flowers.

SEDUM. Lin. Gen. Pl. 513. Tourn. Inst. 262. Tab. 140. *Anacampseros*. Tourn. Inst. 264. Houseleek; in French, *Foubarbe*.

The Characters are,

The Empalement of the Flower is erect, acute, permanent, and cut into 5 Parts. The Flower has 5 plain, Spear-shaped, acute-pointed Petals which spread open, and 5 Nectaria, with small single Scales indented at the Top, each being inserted at their Base to the Outside of the Germen; it has 10 Awl-shaped Stamina, the Length of the Petals, terminated by roundish Summits, and 5 oblong Germina ending in slender Styles crowned by obtuse Stigmas. The Germina become 5 erect spreading Capsules compressed, acute-pointed, opening from Top to Bottom, and filled with small Seeds.

The Species are,

1. SEDUM foliis oblongis obtusis teretiusculis sessilibus patentibus, cymâ ramosa. Hort. Cliff. 177. Houseleek with oblong, obtuse, taper Leaves sitting close to the Stalks spreading open, and a branching Stalk. *Sedum minus teretifolium album*. C. B. P. 177. Stone Crop, or smaller Houseleek with taper Leaves and white Flowers.

2. SEDUM foliis oppositis ovatis obtusis carnosiss, caule infirmo floribus sparsis. Lin. Sp. Pl. 431. Houseleek with oval, fleshy, blunt Leaves placed opposite, a weak Stalk, and Flowers growing thinly. *Sedum minus, circinato folio*. C. B. P. 223. Lesser Houseleek with a roundish Leaf.

3. SEDUM foliis subulatis confertis basi membranacea solutis, floribus cymosis. Hort. Cliff. 176. Houseleek with Awl-shaped Leaves growing in Clusters, whose Bases have a loose Membrane and sprouting Flowers. *Sedum minus à rupe St. Vincentii*. Raii Syn. 2. 155. Lesser Houseleek, or Stone Crop of St. Vincent's Rock.

4. SEDUM foliis subulatis carnosiss patentibus, caule dichotomo, cymis erectis. Houseleek with fleshy, Awl-shaped, spreading Leaves, a Stalk divided by Pairs, and erect Tops. *Sedum Hispanum, folio glauco acuto, flore albido*. Boerb. Ind. alt. 1. 287. Spanish Houseleek with a gray-coloured acute Leaf, and a white Flower.

5. SEDUM foliis subovatis adnato-sessilibus gibbis erectiusculis alternis, cymâ trifida. Hort. Cliff. 177. Stone Crop with oval, gibbous, erect, alternate Leaves sit-

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ting close to each other, and a trifid Top. *Sedum parvum acre, flore luteo*. I. B. 3. 994. The common Stone Crop, or Wall Pepper.

6. SEDUM foliis subcylindricis obtusis alternis, cymâ semper erectâ. Lin. Sp. Pl. 432. Houseleek with obtuse almost cylindrical Leaves which grow alternate, and the Top always erect. *Sedum arvense, flore rubente*. C. B. P. 283. Field Houseleek with a red Flower.

7. SEDUM caule erecto solitario annuo, foliis ovatis sessilibus gibbis alternis, cymâ recurvâ. Flor. Suec. 319. Houseleek with an erect, annual, single Stalk, oval gibbous Leaves placed alternate, and a recurved Top. *Sedum minimum non acre flore albo*. Raii Syn. 2. p. 115. The least Stone Crop, not biting, with a white Flower.

8. SEDUM caulibus decumbentibus, foliis subulatis carnosiss patentibus, floribus paniculatis reflexis. Stone Crop with trailing Stalks, Awl-shaped, fleshy, spreading Leaves, and Flowers growing in reflexed Panicles. *Sedum minus luteum, ramulis reflexis*. C. B. P. 283. Smaller yellow Houseleek with reflexed Branches.

9. SEDUM foliis subovatis adnato-sessilibus gibbis erectiusculis sexsariam imbricatis. Flor. Suec. 390. Stone Crop with almost oval, gibbous, erect Leaves growing close to each other, and imbricated six Ways. *Sempervivum minus vermiculatum inspidum*. C. B. P. 204. Inspid Stone Crop.

10. SEDUM caule erecto, foliis planiusculis, pedunculisque subulosis. Lin. Sp. Pl. 432. Houseleek with an erect Stalk, plain Leaves, and Foot Stalks somewhat hairy. *Sedum palustre subhirsutum purpureum*. C. B. P. 285. Hairy Marsh Houseleek with purple Flowers.

11. SEDUM foliis planiusculis angulatis, floribus lateralibus subsessilibus solitariis. Hort. Cliff. 176. Houseleek with plain angular Leaves, and single Flowers sitting close to the Sides of the Stalk. *Sedum echinatum, vel stellatum, flore albo*. J. B. 3. 680. Prickly or starry Houseleek with a white Flower.

12. SEDUM foliis planis, caule ramoso, floribus paniculatis. Hort. Cliff. 176. Houseleek with plain Leaves, a branching Stalk, and Flowers growing in Panicles. *Sedum Cepaea dictum*. H. L. B. Houseleek called *Cepæa*.

13. SEDUM foliis lanceolatis serratis planis, caule erecto, cymâ sessili terminali. Lin. Sp. Pl. 430. Houseleek with plain, Spear-shaped, sawed Leaves, and an erect Stalk terminated by a Head of Flowers sitting close to it. *Anacampseros flore flavo*. Amman. Ruth. 96. Tab. 11. Orpine with a yellow Flower.

14. SEDUM foliis oblongo-ovatis carinatis superne serratis, corymbo terminali. Houseleek with oblong, oval, keeled Leaves sawed on their upper Part, and a Stalk terminated by a Corymbus of Flowers. *Telephium vulgare*. C. B. P. 287. Common Orpine or Live-long.

15. SEDUM foliis planiusculis serratis, corymbo folioso, caule erecto. Lin. Sp. Plant. 430. Houseleek with plain sawed Leaves, a leafy Corymbus of Flowers, and an erect Stalk. *Telephium purpureum minus*. C. B. P. Smaller purple Orpine or Live-long.

16. SEDUM foliis ternis planiusculis serratis, caule erecto corymbo terminali. Houseleek with plain sawed Leaves growing by Threes, and an erect Stalk terminated by a Corymbus. *Telephium purpureum majus*. C. B. P. 287. Greater purple Orpine or Live-long.

17. SEDUM foliis ovatis integerrimis, summis amplexicaulibus, corymbo terminali. Houseleek with oval entire Leaves

Leaves which at the Top embrace the Stalk, and a Corymbus of Flowers terminating the Branches. *Telephium Lusitanicum hematodes maximum*. H. R. Par. The greatest Portugal bloody Orpine.

18. *SEDUM foliis cuneiformibus inegerrimis, caulibus decumbentibus, floribus corymbosis*. Lin. Sp. Pl. 430. Houseleek with Wedge-shaped entire Leaves, trailing Stalks, and Flowers growing in a Corymbus. *Anacampteros minor, rotundiore folio, sempervirens*. J. B. 3. 682. Smaller and rounder-leaved ever-green Orpine.

The 1st Sort grows naturally on old Walls in many Parts of *England*, so is seldom planted in Gardens, but, as it is a medicinal Plant, I have placed it here; this hath slender trailing Branches, garnished with taper succulent Leaves about half an Inch long, standing alternately round the Branches. The Flower Stalks rise 4 or 5 Inches high; their lower Part is garnished with Leaves which spread out horizontally; the upper Part of the Stalk divides into small Foot Stalks, supporting many white Star-pointed Flowers gathered into a Sort of Umbel. These appear in *July*, and are succeeded by five-cornered Capsules filled with small Seeds which ripen in Autumn.

The 2d Sort also grows on old Walls in many Parts of *England*. The Stalks are very slender and infirm; the Leaves very short, oval, and of a gray Colour; they are placed by Pairs opposite. The Flowers are set thinly at the Top of the Stalks; they are small, white, and their Petals are obtuse; the Summits upon the Stamina are pretty large, and of a bright purple Colour. It flowers the same Time as the former.

The 3d Sort grows naturally on *St. Vincent's Rock* near *Bristol*, and in several Parts of *Wales*; this has slender purple Stalks which trail on the Ground and are closely garnished with short Awl-shaped Leaves, placed all round the Stalks, which have a short loose Membrane at their Base, which falls off on being touched; the Leaves toward the Top of the Stalk close together; they are of Sea-green Colour, and not very succulent. The Flowers grow at the Top of the Stalks in roundish Bunches; they are of a bright yellow Colour, and come about the same Time as the former. This Plant, when once placed on a Wall, will propagate itself in Plenty by its trailing Branches, which put out Roots from their Joints.

The 4th Sort grows naturally in *Spain*; this is an annual Plant with upright Stalks, which rise 3 or 4 Inches high, garnished with fleshy Awl-shaped Leaves, near an Inch long, which spread out on every Side; they are of a gray Colour. The Top of the Stalk divides into 2 slender erect Branches, which have small white Star-pointed Flowers ranged above each other, and the Top of the Stalk at the Division of the Branches is terminated by 2 or 3 Flowers sitting close. This flowers in *June*, and the Seeds ripen the Beginning of *August*, which, if permitted to scatter the Plants will come up without Care.

The 5th Sort is the common Stone Crop or Wall Pepper, so called for the acrid biting Quality of the Leaves; this grows very common on old Walls and Buildings in every Part of *England*, and is so well known as to require no Description. There are 2 Va-

rieties of it, one with a large, and the other a small yellow Flower.

The 6th Sort grows on moist Rocks in several Parts of *France* and *Germany*, and is seldom seen in Gardens; this rises with an erect Stalk about 3 Inches high, garnished with obtuse cylindrical succulent Leaves. The Stalk divides upward into 3 or 4 Branches which sustain small purplish Flowers standing erect.

The 7th Sort grows naturally on dry barren Rocks in the North of *England*; this is an annual Plant with an erect Stalk garnished with oval Leaves placed alternate. The Stalk seldom rises above 2 or 3 Inches high; the Leaves sit close to the Stalks, and are of a grayish Colour; the Flowers grow at the Top of the Stalk in a reflexed Spike; they are small and white.

The 8th Sort grows on old Walls and Buildings in most Parts of *England*, and is by some called Prick-Madam; this has long trailing Stalks, garnished with fleshy Awl-shaped Leaves spreading out almost horizontally; they are of a gray Colour, and end in acute Points. The Flowers grow in reflexed Bunches at the Top of the Stalks; they are Star-pointed, and, of a bright yellow Colour.

The 9th Sort is less common than either of the former. I have found it growing on the Rocks in *Wales*. This hath the Appearance of common Stone Crop, but the Stalks and Leaves are larger, and have no biting Taste; the Leaves are ranged in six Rows, like the Grains of the six-rowed Barley; the Flowers are yellow, and larger than those of the common Stone Crop.

The 10th Sort grows on moist Rocks and boggy Soils in several Parts of the North of *England* and in *Wales*; this seldom rises more than 2 or 3 Inches high. The Stalks are garnished with a few plain hairy Leaves, and are terminated by purple Flowers growing thinly. It flowers in *June*.

The 11th Sort grows naturally in *Italy* and *Germany*; this is a low annual Plant. The Leaves are plain and angular; the Stalks rise 3 Inches high, dividing at Top into 2 or 3 Parts; the Flowers come out singly from the Side of the Stalk; they are white, Star-pointed, and succeeded by Star-pointed rough Capsules.

The 12th Sort is an annual Plant which grows naturally in the South of *France* and in *Italy*; this hath plain succulent Leaves. The Stalks rise 6 or 7 Inches high, dividing into smaller Branches which sustain small white Flowers growing in large Panicles; these appear in *June*, and the Seeds ripen the Beginning of *August*, which if permitted to scatter will come up without Care. This loves a warm dry Soil.

The 13th Sort grows naturally in *Siberia*; this has a perennial Root, composed of many thick fleshy Fibres, from which come out several Stalks which rise near a Foot high, and are garnished with Spear-shaped plain thick Leaves placed alternately on every Side; they are 2 Inches and a Half long, and 3 Quarters broad, slightly sawed on their Edges. The Stalk is terminated by a flat Corymbus of Flowers, which sit very close on the Top; they are of a bright yellow Colour, composed of 5 Spear shaped Petals which are erect, and spread out at the Top; the Stamina are large, erect, and terminated by oval, Sulphur-coloured Summits. This flowers in *June*, and the Seeds ripen in *August*.

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The 14th Sort is the common Orpine, which grows naturally in Woods and shady Places in many Parts of *England*. Of this there are two Varieties, one with white, the other with purple Flowers. This has a perennial Root composed of many glandulous Knobs, from which come out round succulent Stalks about 2 Feet high, divided toward the Top into smaller Branches; these are garnished with fleshy, oval, oblong Leaves a little Keel-shaped, which stand round the Stalks without Order; they are 2 Inches long and one broad, of a gray Colour, and sawed toward their Points. The Stalk is terminated by a Corymbus of Flowers which are Star-pointed, and in some they are white, and in others purple; they appear in *July*, and are succeeded by Capsules filled with small Seeds which ripen in *Autumn*.

This Sort is used in Medicine; it is vulnerary and astringent, and is greatly recommended for its wonderful Virtue in easing Pains. The Leaves, bruised and laid on the Part, produce this Effect both in green Wounds and putrid Ulcers, and, if applied to Corns, will in a short Time take them away.

The 15th Sort is not common in *England*; this hath Roots like the former. The Stalks grow more erect; they are of a purple Colour; the Leaves are flatter and more sawed on their Edges; they are of a dark green Colour and thicker Substance; the Flowers are purple.

The 16th Sort has a strong succulent erect Stalks which are purple, and rise higher than either of the former. The Leaves are larger, of a dark green Colour, sawed on their Edges, and stand by Threes round the Stalk; the Flowers are purple, and collected into a large Corymbus terminating the Stalk. This flowers in *July*.

The 17th Sort grows naturally in *Portugal*; there are two Varieties of it, one with white, the other with purple Flowers. The Roots are composed of many thick fleshy Knobs; the Stalks are thick, succulent, and round; they rise near 3 Feet high, and are garnished with oval succulent Leaves which are entire; they are 3 Inches long, and 2 and a Quarter broad, placed by Pairs, and those on the upper Part embrace the Stalk with their Base; they are of a pale herbaceous Colour. The Flowers are collected in large Bunches which terminate the Stalks; these appear in *July*, and are succeeded by Seeds which ripen in *Autumn*.

The 18th Sort grows naturally in *Italy*. The Roots are fibrous; the Stalks trail on the Ground, and are garnished with Wedge-shaped Leaves standing alternately round the Stalks; they are almost an Inch long, and half an Inch broad. The Flowers are disposed in a compact Corymbus which sits close on the Top of the Stalks; they are Star-shaped, of a purple Colour, and appear in *July*. This Plant is an Ever-green, which renders it more valuable than the other Sorts.

All the Sorts of Stone Crop are easily propagated by planting their trailing Stalks either in Spring or Summer, which soon put out Roots, but, as they thrive much better on Rocks, old Walls or Buildings, than in the Ground, they may be disposed upon Rock Work in such a Manner as to have a good Effect, and where there are unsightly Buildings, their Tops may be covered with these Plants, so as to hide their Deformity:

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In such Places they will appear to greater Advantage than on the Ground. If the Cuttings or Roots of the perennial Sort are planted in some soft Mud laid upon the Walls or Buildings, they will soon take Root, and then spread into every Joint or Crevice, and in a short Time cover the Place, and, if the Seeds of those annual Sorts which grow naturally in dry Places are sown soon after they are ripe on the Top of Walls, the Plants will come up, and maintain themselves without farther Care.

The several Sorts of Orpine may be easily propagated by Cuttings during the Summer Months, or by parting their Roots either in Spring or Autumn; these thrive best in a dry Soil and shady Situation, but may also be planted for the same Purposes as the other Sorts, especially the 18th Sort, which is ever-green. The Stalks of this Kind hang down, and have a very good Effect in Rock Work, and the Plants require no Care, for when they are fixed in the Place, they will spread and propagate fast enough.

The Stalks of the common Orpine are frequently cut in Summer, and fastened to Laths of the Size of Chimney Boards, which, being framed together, are used for screening the Sight of the Fire Grates in Rooms; these Stalks will shoot and spread over the Frame, and, if the Frames are taken out once a Week, and the Stalks watered over to refresh them, they will continue in Verdure for two Months.

SEED: The Seed of a Plant consists of an Embryo with its Coat or Cover. The Embryo, which contains the whole Plant in Miniature, and which is called the Germ or Bud, is rooted in the Placenta or *Cotyledon*, which makes the Coat or *Involucrum*, and serves the same Purposes as the *Secundines*, i. e. the *Chorion* and *Amnion* in Animals.

The Placenta or *Cotyledon* of a Plant is always double, and in the Middle and common Center of the two is a Point or Speck, which is the Embryo or *Plantule*. This *Plantule*, being acted on and moved by the Warmth of the Sun and the Earth, begins to expand, and protrudes or shoots out its Radicle or Root both upward and downward. By this it absorbs the nutritious Juice from the Earth, and so grows and increases, and, the requisite Heat continuing, the Growth continues.

Thus, e. g. a Pea or Bean, being committed to the Ground, is first found to cleave into two Parts, which are, as it were, two Leaves or Lobes of the Placenta, and in the Fissure appears a Point, which shoots out a Root downward, and a Bud upward, the first spreading itself in the Soil to catch the Moisture thereof, and the latter, mounting into the Air, becomes the Stem or Body of the new Plant.

It is very remarkable how the *Plumule*, or future Stem, should always get uppermost, and the Radicle or Root be turned downward, and this too perpendicularly to the Horizon, and not only this, but if, by any external Means, the Stem be diverted from this Perpendicular, and bent, for Instance, toward the Earth, instead of persevering in that Direction, it makes an Angle or Elbow, and redresses itself.

The same is observed in Trees, &c. blown down, with their Roots, by the Wind, or in those planted in Pots, upon turning the Pots on one Side.

Now

Now the Seed, from which a Plant arises, being the Plant itself in Miniature, it is easy to suppose that, if it be deposited in the Ground with the *Plumule* perpendicularly upward, and the Radicle downward, the Disposition should be maintained in its future Growth.

But it is known that Seeds, sown either of themselves, or by the Help of Man, fall at random, or among an infinite Number of Situations of the *Plumule*, &c. The perpendicular one upward is but one, so that in all the rest it is necessary the Stem and Root each make a Bend, to be able the one to emerge directly upwards, the other downward. Now what Force is it that effects this Change, which is certainly an Action of Violence?

Mr. *Dodart*, who first took Notice of the Phenomenon, accounts for it by supposing the Fibres of the Stem of such a Nature, as to contract and shorten by the Heat of the Sun, and lengthen by the Moisture of the Earth; and on the contrary, the Fibres of the Root to contract by the Moisture of the Earth, and lengthen by the Heat of the Sun.

On this Principle, when the *Plantule* is inverted and the Root a-Top, the Fibres of the Root being unequally exposed to the Moisture, viz. the lower Parts more than the upper, the lower will contract, and this Contraction be promoted by the Lengthening of the upper from the Action of the Sun; the Consequence whereof will be, the Roots recoiling, insinuating farther into the Earth, and getting beneath the Body of the Seed.

In a Word: The Earth draws the Root toward itself, and the Sun promotes its Descent: on the contrary, the Sun draws up the Plume, and the Earth in some Measure, sends it towards the same.

Mr. *De la Hire* accounts for the same Perpendicularity, by only conceiving the Root to draw a coarser and heavier Juice, and the Stem a finer and more volatile one. In the *Plantule* therefore we may conceive a Point of Separation, such as, that all on one Side, e. g. the radial Part is unfolded by the grosser; and all on the other, by more subtle Juices.

If the *Plantule* then be inverted, and the Root a-Top, as it still imbibes the grosser and heavier Juice, and the Stem the lighter; the Point of Separation being conceived as the fixed Point of a Lever, the Root must descend, and at the same Time that the volatile Juices imbibed by the Stem, tend to make it mount. Thus is the little Plant turned on its fixed Point of Separation, till it be perfectly erect.

The Plant thus erected, M. *Parent* accounts for the Stem's continuing to rise in the vertical Direction, thus: The nutritious Juice being arrived at the Extremity of a rising Stalk, and there fixing into a vegetable Substance, the Weight of the Atmosphere must determine it to fix in a vertical Position, so that the Stalk will have acquired a new Part of Perpendicularity over the rest; just as in a Candle, which held any how obliquely to the Horizon, the Flame will still continue vertical, by the Pressure of the Air.

The new Drops of Juice that succeed, will follow the same Direction; and as all together form the Stem, that must of Course be vertical, unless some particular Circumstances intervene.

And that, whereas the Branches are likewise observed, as much as possible, to affect Perpendicularity

in most Instances, insomuch that though they be forced it shoot out of the Stem horizontally, yet in their Progress they erect themselves; M. *Parent* solves this, from the vertical Tendency of the nutritious Juice up the Stem; for the Juice, being received in this Direction into the new tender Buds, finds at first little Resistance; and afterwards, as the Branch grows firmer, it furnishes a longer Arm of a Lever to act by.

Mr. *Astruc* accounts for the perpendicular Ascent of the Stems, and their redressing themselves when bent, on these two Principles.

1. That the nutritious Juice arises from the Root to the Top in longitudinal Tubes, parallel to the Side of the Plant, which communicate either by themselves, or by Means of other horizontal Tubes, proceeding from the Circumference of the Plant, and terminated in the Pith.

2. That Fluids contained in Tubes, either parallel or oblique to the Horizon, gravitate on the lower Part of the Tubes, and not at all on the upper.

From hence it easily follows, that in a Plant posited either abliquely or parallel to the Horizon, the nutritious Juice will act more on the lower Part of the Canals than the upper; and by that means insinuate more into the Canals communicating therewith, and be collected more copiously therein; thus the Parts on the lower Side will act more on the lower Part, and will receive more Accretion, and be more nourished, than those on the upper; the Consequence whereof must be, that the Extremity of the Plant will be obliged to bend upward.

The same Principle brings the Seed into its due Situation at first. In a Bean planted upside down, the Plume and Radicle are easily perceived with the naked Eye, to shoot at first directly for about an Inch; but thenceforth they begin to bend, the one downward, and the other upward.

The two *Placentulae* or *Cotyledons* of a Seed are, as it were, a Case to this little tender *Plantule* or Point, covering it up, sheltering it from Injuries, and feeding it from their own proper Substance; which the *Plantule* receives and draws to itself, by an infinite Number of little Filaments or Ramifications, called *Funes Umbilicales*, or Navel Strings, which it sends into the Body of the *Placenta*.

The *Cotyledons*, for the most part, abound with a Balsam disposed in proper Cells; and this seems to be Oil brought to its greatest Perfection, while it remains humid, and then lodged in these Repositories; one Part of the Composition of this Balsam is oily and tenacious, and serves to defend the Embryo from any extraneous Moisture, and, by its Viscidity, to entangle and retain that fine, pure, volatile Spirit, which is the ultimate Production of the Plant.

This Oil is never observed to enter into the Vessels of the Embryo, which are too fine to admit so thick a Fluid. The Spirit, however, being quickened by an active Power, may possibly breathe a vital Principle into the Juices that nourish the Embryo, and stamp upon it the Character that distinguishes the Family; after which every Thing is changed into the proper Nature of that particular Plant. That this Spirit now is truly the efficacious Part, is evident; for when that is gone off, the Oil that remains is quite vapid and inactive. It is this that gives Plants their fragrant Smell and peculiar

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Tastes, nor do their particular Colours a little depend upon it.

Now when the Seed is committed to the Earth, the *Placenta* still adheres to the Embryo for some Time, guards it from the Access of noxious Colds, &c. and even prepares and purifies the cruder Juice the Plant is to receive from the Earth, by straining it, &c. through its own Body.

This it continues to do, till the *Placenta* being a little inured to its new Element, and its Root tolerably fixed in the Ground and fit to absorb the Juice thereof, it then perishes, and the Plant may be said to be delivered; so the Nature observes the same Method in Plants contained in Fruits, as in Animals in the Mother's Womb.

It is very surprizing, how many Sorts of Seeds will continue good for several Years, and retain their growing Faculty, whereas many other Sorts will not grow when they are more than one Year old; which is, in a great Measure owing to their abounding more or less with Oil, as also the Nature of the Oil, whether it is of a cold or hot Quality, and the Texture of their outward Covering. As for Example; the Seeds of Cucumbers, Melons, and Gourds, which have thick horny Coverings, and the Oil of this Seed being of a cold Nature, continue good eight or ten Years; and Raddish, Turnep, Rape, &c. with other oily Seeds (whose Coats, though they are not so hard and close as the others, yet) abounding with Oil, which is of a warmer Nature, will keep good three or four Years; whereas the Seeds of Parsley, Carrots, Parsneps, and most other umbelliferous Plants, whose Seeds are, for the most part, of a warm Nature, and have little Oil in them, lose their growing Faculty often in one Year, but seldom remain good longer than two Years. Indeed all Sorts of Seeds are preserved best, if kept in the Pods or Husks wherein they grow; especially if they are not separated from the *Placenta*, to which they are fastened by an umbilical Cord, through which they received their Nourishment in their Embryo State; so that whoever would send Seeds to a distant Country, should always take Care they are full ripe before they are gathered, and that they are preserved in their Pods or Husks; and when they are packed up for Exportation, there should be great Care taken, that they are not shut up too closely from the Air; which is absolutely necessary to maintain the Principle of Vegetation in the Seed (though in a less Degree) as it is to nourish the Plant when germinated, as I found by trying the following Experiment, viz. Having saved a Parcel of fresh Seeds of several Kinds, as Lettuce, Parsley, Onions, &c. I took a Parcel of each Kind, and put into Glass Phials; these I stopped down close, and sealed hermetically, then put them up in a Trunk; the other Parts of the same Seeds I put into Bags, and hung them up in a dry Room, where the Air had free Admittance; in which Place they remained a whole Year; and in the following Spring I took out a Part of each Parcel of Seeds from the Phials, as also from the Bags, and sowed them at the same Time, and upon the same Bed, where they had an equal Advantage of Sun, Air, &c. The Result of this Experiment was, that almost all the Seeds which

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I took out of the Bags grew extremely well, but of those which were kept in the Phials not one came up; after which, I sowed the remaining Part of the Seeds in the Phials, but had not one single Plant from the whole, whereas those preserved in the Bags grew very well both the second and third Years. And this Experiment was afterward tried by one of my particular Friends, with whom the Effect was the same as with me. And some Years after this, a Gentleman of great Eminence for his Knowledge of Plants, being very desirous to procure Seeds from every Country, where the *British* Nation had any Commerce, gave his Instructions to all the Agents Abroad, to send him over all the Sorts of Seeds they could collect in their different Countries, and to put them up in Bottles, sealing the Mouths of the Bottles as close as possible, to exclude the Air; which was done by several of his Correspondents, who sent him great Quantities of Seeds, but not one of them grew when they were sown; so that those Persons who send Seeds to a distant Country, should never be guilty of the like Error.

These Experiments prove, that all Seeds require some Share of fresh Air, to keep the *Germen* in a healthy State; and that where the Air is absolutely excluded, the vegetative Quality of the Seeds will be soon lost; therefore the anointing of the Seeds, or covering them over with Fat or Oil, should not be practised; for as this will in a great Measure shut up the Pores of the Seeds, it will prevent the Transpiration and Inspiration of Air, whereby the Seeds will soon be spoiled.

The Earth, which is the natural Nurse to all Seeds, will preserve them much longer than any other Body, provided they are buried so deep, as to be beyond the Influence of Sun and Showers, whereby they are prevented from vegetating. I have known Seeds of several Plants remain buried three Feet deep above twenty Years, and when turned up to the Air, have grown as well as fresh Seeds; and a particular Friend of mine shewed me a Spot of Ground, which was covered with Corn Sallet, the Seeds of which he assured me had been buried thirty-two Years in that Place, and when turned up again to the Air, were as productive as new Seeds.

How the vegetative Life is so long preserved in Seeds, by being so deeply immerged in the Ground, is very difficult to explain; but as the Fact is very notorious, it well accounts for the Production of Plants out of Earth taken from the Bottom of Vaults, Houses, and Wells; and from the Earth which has been taken at a very great Depth in those Places, there have been many Plants produced, which were not Inhabitants of the neighbouring Soil; and this has been brought as a Proof to support the Doctrine of spontaneous Productions, by some who have asserted, that Plants are often produced without Seed.

The Earth which has been brought to *England*, from very distant Countries, having many of the Seeds of those Plants, which grew in those Places, buried therein, when this has been placed in a proper Degree of Heat, and spread abroad, the Seeds have vegetated, and great Numbers of Plants have come up; whereby many Plants, which would have escaped the Notice of those Persons who collect Seeds to send to *Europe*, have been obtained.

A Method for raising such Seeds which have hard Coats or Shells surrounding them; and that have been judged very difficult, if not impossible, to be raised in England.

In the Year 1724, I had a Parcel of fresh Cocoa Nuts given me, which was brought over from *Barbadoes*: Part of these Nuts I divested of their outward Coat or Husk, and the other Part I left entire, as I received them.

Both these Parcels I planted in large Pots filled with good fresh Earth, and plunged the Pots into hot Beds made of Tanners Bark, giving them gentle and frequent Waterings, as the Earth in the Pots seemed to require; but not one out of the whole Number had made any Attempt to shoot, as I could perceive; and upon taking them out of the Pots, I found they were rotten.

About four Months after, I received another fresh Parcel of Cocoa Nuts from *Barbadoes*, which I treated in another Manner; from Part of these I cut off the outer Coat or Husk, and the other Part I left entire, as before: But supposing it was owing to my planting the other Parcel in Pots, that they did not succeed, I made a fresh hot Bed with Horse Dung, and covered it over with fresh Earth about eighteen Inches thick, in which I planted the Nuts; observing, as before, to supply it with convenient Moisture, as also to keep the hot Bed in an equal Temper of Heat, which I was guided to do by a Thermometer, graduated for the Use of hot Beds; but with all my Care, I had no better Success than before, not one of the Nuts making any Essay towards shooting.

The Year following, I had another Parcel of Cocoa Nuts given me, which, considering my former ill Success, I planted in a different Manner, as follows:

Having a hot Bed, which had been lately made with Tanners Bark, and which was filled with Pots of exotick Plants, I removed two of the largest Pots, which were placed in the Middle of the Bed; and, opening the Tanners Bark under the Place where the two Pots stood, I placed the two Cocoa Nuts, therein, laying them Side Ways, to prevent the Moisture (which might descend from the Pots) from entering the Hole at the Base of the Fruit, and thereby rotting the seminal Plant upon its first germinating.

I then covered the Nuts over with the Bark two or three Inches thick, and placed the two Pots over them in their former Station.

In this Place I let the Nuts remain for six Weeks, when removing the two Pots and uncovering the Nuts, I found them both shot from the Hole, in the Base of the Fruit an Inch in Length, and from the other End of the Fruit were several Fibres emitted two or three Inches in Length.

Upon finding them in such a Forwardness, I took them out of the Bark, and planted them in large Pots filled with good fresh Earth; plunging the Pots down to the Rims in Tanners Bark, and covering the Surface of the Earth, in the Pots half an Inch with the same; soon after which, the young Shoots were above two Inches long, and continued to thrive very well.

I communicated this Method to some of my Acquaintance, who have tried it with the same Success; and if the Nuts are fresh, scarce any of them miscarry.

This led me to try, if the same Method would succeed as well with other hard shelled exotick Seeds, which I could not, by any Method I had before tried, get to grow; as the Bonduck or Nickar Tree, the *Phaseolus Brasiliensis lobis villosis pungentibus*, *Maximus Hermannii*, or Horse-eye Bean, with several others; and I have found it both a sure and expeditious Way to raise any Sort of hard shelled Fruits or Seeds.

For the Heat and Moisture (which are absolutely necessary to promote Vegetation) they here enjoy in an equal and regular Manner, the Tanners Bark (if rightly managed) keeping near an Equality of Heat for three Months; and the Water which descends from the Pots, when they are watered, is by the Bark detained from being too soon dissipated; which cannot be obtained in a common hot Bed, the Earth in such being worked away by the Water, and thereby leaving the Seeds often destitute of Moisture.

Some of these Seeds I have had shoot in a Fortnight's Time, which, I am informed, would not have so done in a Month, in their natural Soil and Climate.

I have also found it an excellent Method to restore Orange (or any other exotick) Trees, which have suffered by a tedious Passage, in being too long out of the Ground, by laying their Roots and Stems in a moderate Tan Bed for three or four Days before they are planted; insomuch that I recovered two Orange Trees, which had been ten Months without either Earth or Water.

In the common Method of sowing Seeds, there are many Kinds which require to be sown soon after they are ripe; and there are many others which lie in the Ground a Year, sometimes two or three Years, before the Plants come up; so that when the Seeds which come from distant Countries are sown, the Ground should not be disturbed, but wait with Patience, in Expectation of the Plants, at least two Years; for it has often happened to Seeds which I have sown, that have been brought from *America*, that Part of them have come up the first Season, some the next, and others not until the third Year; so that if the Ground had been disturbed, I should have lost many Plants, which, by my waiting so long, came up and succeeded very well.

As there is such Difference in the Length of Time, which some Seeds will keep good over others, I thought it would not be unacceptable, if I should add an Account of those Seeds which require to be sown soon after they are ripe; and of others, how long they may be kept good, if they are carefully saved; which I have drawn out in the following Table, which will, in a great Measure, direct how those Seeds, not here included, require to be treated.

The first Class of Seeds which I shall enumerate, is of those which should be sown in Autumn, soon after they are ripe; otherwise many of them will not succeed, and others will often remain in the Ground a whole Season, if they are kept out of the Ground till Spring, whereby a full Year will be lost.

Adonis, or *Flos Adonis*, see *Adonis*.
Alexanders, or *Alissanders*, see *Smyrnum*.
Anemony, or *Windflower*, see *Anemone*.
Angelica.

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Arse-smart the Eastern Sort, *see* Persicaria,
 Ash-keys, *see* Fraxinus.
 Asphodel, or Kingspear, *see* Asphodelus.
 Auricula.
 Beech-mast, *see* Fagus.
 Bishopsweed, *see* Ammi.
 Christopher-herb, *see* Adæa.
 Ciceli *see* Myrrhis.
 Colchicum, or Bastard-saffron.
 Cornfallad, *see* Valeriana.
 Cornflag, *see* Gladiolus.
 Crocus.
 Crown Imperial, *see* Fritillaria.
 Fennel-giant, *see* Ferula.
 Flower-de-luce, *see* Iris.
 Fraxinella, *see* Dictamnus.
 Fritillaria, or chequered Tulip.
 Gentian, *see* Gentiana.
 Ground Pine, *see* Teucrium.
 Hares-ear, *see* Bupleurum.
 Hartwort, *see* Bupleurum and Sefeli.
 Hogs-fennel, *see* Peucedanum.
 Hornbeam, *see* Carpinus.
 Hyacinth, *see* Hyacinthus.
 Juniper, *see* Juniperus.
 Laserwort, *see* Laserpitium.
 Lilly, *see* Lilium.
 Lilly-asphodel, *see* Crinum and Hemerocallis.
 Lilly-hyacinth, *see* Scilla.
 Lilly-narcissus, *see* Amarillis.
 Lovage *see* Ligusticum.
 Mandrake, *see* Mandragora.
 Maple, *see* Acer.
 Masterwort, *see* Imperatoria and Astrantia.
 Mercury, *see* Mercurialis.
 Moly, *see* Allium.
 Mulcari.
 Narcissus, or Daffodil.
 Oak, *see* Quercus.
 Oak of Jerusalem, *see* Chenopodium.
 Pasque Flower, *see* Pulsatilla.
 Piony, *see* Pæonia.
 Polyanthus, *see* Primula.
 Ranunculus or Crowfoot.
 Samphire, *see* Crithmum.
 Sourvy-Grass, *see* Cochlearia.
 Sefeli, or Sermountain, *see* Siler.
 Snow-drop, *see* Galanthus.
 Sowbread *see* Cyclamen.
 Spiderwort, *see* Anthriscum.
 Spignel, *see* Meum.
 Star of Botzolem, *see* Ornithogalum.
 Staves-acre, *see* Delphinium.
 Tulip, *see* Tulipa.
 Turnsole, *see* Heliotropium.
 Yew Tree, *see* Taxus.
 In the next Class I shall enumerate those Sorts of
 Seeds, which are best the first Spring after they are
 sowed, many of which will not grow if they are kept
 longer; wherefore those who deal in Seeds, should de-
 stroy the Seeds they have remaining after the Season is
 over, and not sell them to impose on their Dealers, to

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the great Loss of their Crops, nor keep them to mix
 with new Seeds, as is too often practised.
 African Marygold, *see* Tagetes.
 Agrimony, *see* Agrimonia.
 Alkanet, *see* Buglossum.
 Amaranthoides, or Globe Amaranthus, *see* Gomphrena.
 Anise, *see* Bubon.
 Asparagus, or Spearage.
 Balsamine, *see* Impatiens.
 Basil, *see* Ocimum.
 Bastard Saffron, *see* Carthamus.
 Bay Tree, *see* Laurus.
 Bean, *see* Faba.
 Beet, *see* Beta.
 Blue-bottle, *see* Cyanus.
 Borrage, *see* Borrigo.
 Buckwheat, *see* Fagopyrum.
 Buglossa, *see* Buglossum.
 Canterbury-bell, *see* Campanula.
 Carraway, *see* Carum.
 Carnation, *see* Dianthus.
 Carrot, *see* Daucus.
 Caterpillar, *see* Scorpiurus.
 Celeri, *see* Apium.
 Chervil, *see* Chærophyllyum.
 Chestnut, *see* Castanea.
 Chichling Pea, *see* Cicer.
 Clary, *see* Horminum and Sclarea.
 Columbine, *see* Aquilegia.
 Coriander, *see* Coriandrum.
 Cranesbill, *see* Geranium.
 Cress, *see* Nasturtium.
 Cumin, *see* Cuminum.
 Cypress, *see* Cupressus.
 Dames Violet, *see* Hesperis.
 Everlasting Pea, *see* Lathyrus.
 Fennel, *see* Fœniculum.
 Fennel Flower, *see* Nigella.
 Fenugreek, *see* Trigonella.
 Finocchio, *see* Fœniculum.
 Firr, *see* Abies.
 French Honeysuckle, *see* Hedysarum.
 French Marygold, *see* Tagetes.
 Goats-rue, *see* Galega.
 Globe Thistle, *see* Echinops.
 Gromwell, or Graymil, *see* Lithospermum.
 Henbane, *see* Hyoscyamus.
 Hemp, *see* Cannabis.
 Hollyhock, *see* Alcea.
 Hyssop, *see* Hyssopus.
 Indian Pepper, *see* Capsicum.
 Kidney Bean, *see* Phascolus.
 Larch Tree, *see* Larix.
 Larkspur, *see* Delphinium.
 Lavender, *see* Lavendula.
 Laurel, *see* Padus.
 Leek, *see* Porrum.
 Lentil, *see* Lens.
 Love-apple, *see* Lycopersicon.
 Lupine, *see* Lupinus.
 Lychnis, or Catchfly.
 Mad-apple, *see* Melongena.
 Mallow, the Venetian *see* Hibiscus.
 Marjoram,

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Marjoram, *see* Marjorana.
 Marvel of Peru, *see* Mirabilis.
 Marygold, *see* Calendula.
 Millet, *see* Millium.
 Mullein, *see* Verbascum.
 Moth mullein, *see* Blattaria.
 Navew, *see* Napus.
 Oil-nut, or Palma Christi, *see* Ricinus.
 Roman Nettle, *see* Urtica.
 Onion, *see* Cepa.
 Orach.
 Origany, *see* Origanum.
 Panic, *see* Panicum.
 Parsley, *see* Apium.
 Parsnep, *see* Pastinaca.
 Peas, *see* Pisum.
 Pink, *see* Dianthus.
 Poppy, *see* Papaver.
 Purslain, *see* Portulaca.
 Radish, *see* Raphanus.
 Rape, *see* Napus.
 Rue, *see* Ruta.
 Savory, *see* Satureja.
 Scabious, *see* Scabiosa.
 Skirret, *see* Sisarum.
 Snails, *see* Medica.
 Snapdragon, *see* Antirrhinum.
 Spinach, *see* Spinachia.
 Stockgillflower, *see* Leucoium.
 Succory, *see* Chicorium.
 Sun-flower, *see* Helianthus.
 Thyme, *see* Thymus.
 Tobacco, *see* Nicotiana.
 Trefoil, *see* Trifolium.
 Turnep, *see* Rapa.
 Venus looking Glass, *see* Campanula.
 Venus Navelwort, *see* Omphalodes.
 Vetch, *see* Vicia.
 Woad, *see* Hatis.
 Wall flower, *see* Leucoium.

The next Class of Seeds are such as may be kept two Years and will not be the worse, provided they are well saved, though these are equally good for Use the first Year.

Amaranthus, or Flower-gentle.
 Cabbage, } *see* Brassica.
 Cauliflower, }
 Citrul, or Water Melon, *see* Anguria.
 Clover, *see* Trifolium.
 Convolvulus, or Bindweed.
 Endive, *see* Endivia.
 Flax, *see* Linum.
 Indian Flowering-reed, *see* Cannacorus.
 La-lucern, *see* Medica.
 Lavender, *see* Lavendula.
 Lettuce, *see* Lactuca.
 Mellilot, *see* Trifolium.
 Mustard, *see* Sinapi.
 Sorrel, *see* Acetosa.

The fourth Class of Seeds are such as may be kept three Years or more, and will grow very well afterward, provided they are well saved; and some of the Sorts are generally preferred for being three Years old, parti-

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cularly the Cucumber and Melon Seeds; because when the Seeds are new, the Plants grow too vigorous, and produce a small Quantity of Fruit; but it is not proper to keep these longer than four or five Years, notwithstanding they will grow at eight or nine Years old; because when the Seeds are old, the Plants will be weak, and the Fruit they produce will be small.

Amaranthus, or Flower-gentle.
 Cabbage, *see* Brassica.
 Cedar of Libanus, *see* Larix, if kept in the Cones.
 Cucumber, *see* Cucumis.
 Gourd, *see* Cucurbita.
 Lettuce, *see* Lactuca.
 Melon, *see* Melo.
 Pinus, the Pine Tree, if kept in the Cones.
 Pumpkin, *see* Pepo.
 Savoy, *see* Brassica.
 Simnel, or Squash, *see* Cucurbita.
 Water Melon, *see* Anguria.

The following is a List of such Seeds as will frequently remain in the Earth a whole Year, especially if they are sown in the Spring of the Year; so that whenever the Plants do not come up the first Year, the Ground should remain undisturbed till the following Spring (but must be kept clear from Weeds), when the Plants will come up.

Adonis, or Flos Adonis.
 Alaternus.
 Alexanders, *see* Smyrniurn.
 Angelica.
 Corn fallad, *see* Valerianella.
 Fennel, *see* Foeniculum.
 Fraxinella, or White Dittany, *see* Dictamnus.
 Golden-rod, *see* Solidago.
 Gromwell, or Graymil, *see* Lithospermum.
 Hares-ear, } *see* Bupleurum.
 Hartwort, }
 Hawthorn, *see* Mespilus.
 Hogs-fennel, *see* Peucedanum.
 Holly, *see* Ilex.
 Juniper *see* Juniperus.
 Laserwort, *see* Laserpitium.
 Lovage, *see* Ligusticum.
 Maple, *see* Acer.
 Masterwort, *see* Astrantia.
 Mercury, *see* Mercurialis.
 Moly.
 Piony, *see* Pazonia.
 Sefeli, or Sermountain, *see* Siler.
 Spignel, *see* Meum.
 Starwort, *see* Aster.
 Staves-acre, *see* Delphinium.
 Turnsole, *see* Heliotropium.
 Yew *see* Taxus.

If the Seeds mentioned in this List are sown soon after they are ripe, many of the Sorts will come up the following Spring, but whenever they fail so to do, there will be no Danger of their growing the following Year, provided the Seeds were good, therefore People should not despair of them the first Year. Most of the umbelliferous Plants have this property of remaining in the Ground several Months, and sometimes a whole Year, before the Plants appear; therefore they should

should be managed accordingly, by sowing their Seeds on a Border, which can be suffered to remain undisturbed till the Plants come up. There are some particular Sorts of Seeds, which I have known remain in the Ground eighteen Months, and sometimes two Years, after which Time the Plants have come up very well: Of these Sorts are the *Morina*, *Tribulus terrestris*, *Stavesacre*, *Mercury*, and some others; but as they do not constantly remain so long in the Ground, there can be no Certainty of the Time when the Plants will appear.

The Rules here laid down, concerning the Length of Time which Seeds may be kept out of the Ground and prove good, will in general be found true; being drawn up from several Years Experience, having taken Notes every Year from the Times of sowing great Varieties of Seeds, to the Appearance of the Plants above Ground. And in this I have observed such Oddness in the Growth of Seeds, as is not to be accounted for; as that of sowing Seeds of the same Plant for two or three Years successively, and not having had one Plant arise; and the fourth Year, from the remaining Part of the Seeds, I have had some Plants come up, notwithstanding the Age of the Seeds. At other Times it has happened that some Seeds have grown the same Spring they were sown, and a great Part of them have remained in the Ground till the following Autumn, when the Plants have come up, so that there have been two different Crops from the same sowing.

I have also tried many Experiments in keeping Seeds, and find the best Method to preserve them good is, to keep them in a moderate Temperature of Warmth, where they may not suffer from any Inclemencies in the outward Air, nor have too much Warmth, which will exhale the Moisture too freely, and cause the Seeds to decay sooner than they otherwise would do. This is well known to most People who cultivate Melons, who, when their Seeds are new, which would occasion the Plants being too vigorous, and therefore not so fruitful, put them into the inner Pocket of their Breeches, which are in constant Wear, where they keep them for six Weeks or two Months before they sow them; which will weaken the Seeds, as much as two Years longer keeping in the ordinary Way.

All Sorts of Seeds will keep much longer in their Pods, or outer Coverings, where they can be thus preserved; because the Covering not only preserves them from the Injuries of the outward Air, but if the Seeds are not separated from them, they supply them with Nourishment, and thereby keep them plump and fair. But the Seeds of all soft Fruits, such as Cucumbers, Melons, &c. must be cleansed from the Fruit and Mucilage which surrounds them, otherwise the rotting of these Parts will corrupt and decay the Seeds in a short Time.

When Seeds are gathered, it should always be done in dry Weather, when there is no Moisture upon them; and then they should be hung up in Bags (especially those which Vermin eat) in a dry Room; in which Situation they will keep longer good than if they were closely shut up, and the Air excluded from them.

There are but few People who are curious enough in saving their Seeds; some, for want of Judgment, not distinguishing the best Plants of their Kinds, to let them

grow for Seeds; and others, out of Covetousness to save a great Quantity of Seeds, frequently let a whole Spot of Ground, filled with any particular Sort of Plants, run up to Seed, so that the good and bad Plants are saved indifferently; which is the Occasion of the general Complaint of the Badness of the Seeds which are commonly vended, and is what the Dealers in Seeds should endeavour to remedy.

There is a common Method of trying the Goodness of many Sorts of Seeds, which is, by putting them in Water; and those of them which sink to the Bottom are esteemed good, but what swim on the Surface are rejected as good for little; but this will not hold in many Sorts, for I have saved the Seeds of Melons, which have floated on the Surface of the Water when they were washed from the Pulp, and after keeping them two Years, they have grown well; but the Melons produced on these Plants were not so thick fleshed, as those which were produced from heavy Seeds of the same Melon. The Lightness of many Sorts of Seeds, I apprehend, may be owing to their not having been sufficiently impregnated by the *Farina fecundans*; which is frequently the Case with those Plants that are kept in Stoves, or under Frames, where the external Air is often too much excluded from them; which may be absolutely necessary to the conveying of the *Farina* in Substance, or the gentle Effluvia thereof, to the uterine Cells; and this more particularly may be the Case, in those Sorts which are male and female in different Plants or where the male Flowers grow at remote Distances from the female, on the same Plant; which in the Melons, Cucumbers, Gourds, and many other Sorts of Plants, is constant. Therefore of late Years, since the Doctrine of the Generation of Plants has been better known amongst Gardeners, they have been curious enough to assist Nature in this Operation; but they have had more Regard to the Production of Fruit, than to the obtaining of perfect Seeds; though by procuring of the one, the other must of Course receive the Benefit. This Practice has been principally confined to the setting of the Fruit of their Melons, and early Cucumbers. The Method is this; when the Fruit appears upon the Plants, and the Flower at the Top is just fully expanded, they take some of the most vigorous male Flowers, and with a Pin move the Apices which sustain the *Farina fecundans*, gently up and down, over the Blossom of the female Flowers, whereby the *Farina* is scattered unto them; and also lay one of the fresh blown male Flowers with the open Side over the Mouth of the female Flowers, that hereby the Fruit may be sufficiently impregnated; and where there are male Flowers so situated, as that they may be joined without pulling them off the Plant, it is always to be chosen. By this Method the Gardeners have succeeded in setting the first Fruits of this Sort, which have appeared on the Plants; which before this was practised, generally dropped off, and never grew to any Size; so that very often, when the Weather has proved so unfavourable as to render it unsafe to admit the external Air to the Plants, the Fruit have been produced successively, for three Weeks or a Month, before any of them have been set to grow, but have fallen off soon after they appeared. Therefore this is a convincing Proof of the Necessity

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Necessity for the Ovary of the Fruit to be impregnated, especially where good Seeds are to be obtained; and this will explain the Cause of new Seeds often failing, as hath been already mentioned under the Article of *Generation*; so that many Persons have been deceived by sowing Seeds of their own saving, without knowing how it has happened. I have several Times been deceived in obtaining good Seeds from tender exotick Plants, which have flowered, and produced (to all Appearance) very good Seeds, but many Times they have all failed; which I apprehend was owing to the keeping the Glasses so close, during the Time the Plants were in flower, that the external Air was excluded; which, if it had been admitted, might have assisted the Farina in the Impregnation of the Seed, and thereby have rendered it good; because the same Plants, in more favourable Seasons, when the free Air has been admitted, have produced Plenty of good Seeds.

In the Tables here subjoined, I have given the common *English* Names of the Seed, opposite to which I have added the *Latin* Names, that the Reader may with Ease turn to the several Articles in *The Gardeners Dictionary*, where each Sort is particularly treated of, and Directions are given for their Management.

SEGMENTS OF LEAVES are the Parts of such Leaves of Plants as are divided or cut into many Shreds.

SELAGO. *Lin. Gen. Pl.* 687. *Campborata. Com. Santolina. Boerb.*

The Characters are,

The Flower has a small permanent Empalement of 1 Leaf, cut into 4 Parts at the Top. The Flower is of 1 Petal, it has a very small Tube, scarce perforated; the Brim is spreading, and cut into 5 Parts, the 2 upper Segments are the least. It has 4 Hair-like Stamina, the Length of the Petal, to which they are inserted, 2 of which are longer than the other, terminated by single Summits; and a roundish Germen, supporting a single Style, crowned by an acute Stigma. The Germen becomes a single Seed, wrapped up in the Petal of the Flower.

We have but one Species of this Genus in the *English* Gardens, viz.

SELAGO *corymbis multiplici*, *Lin. Sp. Pl.* 629. *Selago* with a multiplied Corymbus. This is the *Campborata Africana*, *umbellata, frutescens. Hort. Amst.* 2. p. 79. *Shrubby African umbellated Campborata.*

This Plant grows naturally at the *Cape of Good Hope*; it has slender ligneous Stalks which rise 7 or 8 Feet high, but are so weak as to require Support; they send out many slender Branches, garnished with short linear hairy Leaves, that come out in Clusters from the same Point. The Flowers are produced in Umbels at the Top of the Stalks, the general Umbel being composed of a Multiplicity of small Umbels; they are very small, and of a pure white; they appear in *July* and *August*, but are not succeeded by Seeds here.

This Plant is preserved in Gardens more for Variety, than for Beauty, for the Branches grow very irregular, and hang downward, and the Leaves being small make little Appearance, and the Flowers are so small as not to be distinguished at any Distance.

It is propagated by Cuttings, which put out Roots freely, if planted in any of the Summer Months; if these are planted in a Bed of fresh Earth, and covered close

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down with a Bell or Hand Glass, shading them from the Sun, and refreshing them now and then with Water, they will soon put out Roots; then they must be gradually hardened, and afterward transplanted into small Pots, placing them in the Shade till they have new Roots, then they may be placed with other hardy Greenhouse Plants, where they may remain till the End of *October*, when they must be removed into Shelter, for these Plants will not live in the open Air in *England*, but they only require Protection from hard Frost, so they should be treated as the hardiest Kinds of Greenhouse Plants.

SELINUM. *Lin. Gen. Pl.* 300. *Thysselinum. Tourn. Inst. R. H.* 419. Milky Parsley.

The Characters are,

It has an umbellated Flower; the general Umbel is plain and spreading, and the particular Umbels are the same; the Involucrum is composed of many linear Spear-shaped Leaves which spread open; the Umbel is uniform; the Flowers have 5 inflexed Heart-shaped Petals which are unequal; they have 5 Hair-like Stamina terminated by roundish Summits. The Germen is situated under the Flower, supporting 2 reflexed Styles, crowned by single Stigmas; it afterward becomes a plain compressed Fruit channeled on both Sides, parting in two, containing 2 oblong elliptical plain Seeds channeled in the Middle, with Membranes on their Sides.

The Species are,

1. SELINUM *radice fusiformi multiplici*. Milky Parsley with Spindle-shaped Roots. *Thysselinum Plinii. Lob. Icon.* 711. *Pliny's wild milky Parsley.*

2. SELINUM *sublaesescens radice unica. Haller. Helv.* 443. *Selinum* which is almost milky, and having a single Root. *Thysselinum palustre. Tourn. Inst.* 319. *Marsh, wild, milky Parsley.*

The 1st Sort grows by the Sides of Lakes and standing Waters in several Parts of *Germany*; this hath many Spindle-shaped Roots hanging by Fibres which spread, and multiply in the Ground. The Stalks rise 5 or 6 Feet high; they are streaked, and of a purple Colour at Bottom, sending out several Branches toward the Top; the Leaves are finely divided like those of the Carrot, and when broken there issues out a milky Juice; the Stalks are terminated by Umbels of whitish Flowers which come out in *June*, and are succeeded by compressed bordered Seeds which ripen in *August*.

The 2d Sort grows naturally in marshy Places in *Germany*. The Leaves are much longer and cut into narrower Segments than those of the former; the Stalks rise higher; the Umbels are larger, as are also the Seeds. The whole Plant abounds with a caustick milky Juice.

These Plants are preserved in Botanical Gardens for Variety, but are rarely cultivated any where else; they are easily propagated by Seeds, which should be sown in Autumn, and the Plants afterward treated as *Angelica*.

SEMIFISTULAR FLOWERS are such whose upper Part resembles a Pipe cut off obliquely, as in *Aristolochia* or *Birthwort*.

SEMINAL LEAVES are those plain, soft and undivided Leaves that first shoot forth from the greatest Part of all sown Seeds; which Leaves are very different

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from those which succeed on the same Plant, in Size, Figure, Surface, and Position.

A SEMINARY is a Seed Plot adapted or set apart for sowing Seeds. These are of different Natures and Magnitudes, according to the several Plants intended to be raised therein. If it be intended to raise Forest or Fruit Trees, it must be proportionably large to the Quantity of Trees designed, and the Soil should be carefully adapted to the various Sorts of Trees. Without such a Place as this every Gentleman is obliged to buy, at every Turn, whatever Trees he may want to repair the Losses he may sustain in his Orchard, Wilderness, or larger Plantations, so that the Necessity of such a Spot of Ground will easily be perceived by every one; but, as I have already given Directions for preparing the Soil and sowing the Seeds in such a Seminary, under the Article *Nursery*, I shall not repeat it in this Place, but refer the Reader to that Article.

It is also as necessary for the Support of a curious Flower Garden, to have a Spot of Ground set apart for sowing all Sorts of Seeds of choice Flowers, in order to obtain new Varieties, which is the only Method to have a fine Collection of valuable Flowers, as also for sowing all Sorts of biennial Plants to succeed those which decay in the Flower Garden, by which Means the Borders may be annually replenished, which, without such a Seminary, could not be so well done.

This Seminary should be situated at some Distance from the House, and be entirely closed either with a Hedge, Wall, or Pale, and kept under Lock and Key, that all Vermin may be kept out, and that it may not be exposed to all Comers and Goers, who many Times do Mischief before they are aware of it. As to the Situation, Soil, and Manner of preparing the Ground, it has been already mentioned under the Article *Nursery*, and the particular Account of raising each Sort of Plant being directed under their proper Heads, it would be needless to repeat it here.

SEMINIFEROUS. Bearing or producing Seed.

SEMPERVIVUM. *Lin. Gen. Pl. 538. Sedi Species. Tourn. Inst. R. H. 262. Tab. 140.*

The Characters are,

The Flower has a concave permanent Empalement cut into many acute Segments; it has ten oblong, Spear-shaped pointed Petals a little longer than the Empalement, and 12 or more narrow Awl shaped Stamina terminated by roundish Summits; it has 12 Germina placed circularly, sitting upon so many Styles which spread out, and are crowned by acute Stigmas. The Germina become so many short compressed Capsules, pointed on the Outside, and open on the Inside, filled with small Seeds.

The Species are,

1. SEMPERVIVUM *foliis ciliatis, propaginibus patentibus. Lin. Sp. Pl. 464.* Houseleek with hairy-edged Leaves, and spreading Offsets. *Sedum majus vulgare. C. B. P. 283.* Common large Houseleek.

2. SEMPERVIVUM *foliis ciliatis, propaginibus globosis. Lin. Sp. Pl. 464.* Houseleek with hairy-edged Leaves, whose Offsets are globular. *Sedum majus vulgari simile, globulis decidentibus. Mor. Hist. 3. p. 472.* Greater Houseleek resembling the common, and having globular Offsets which fall off.

3. SEMPERVIVUM *foliis integerrimis, propaginibus patulis. Lin. Sp. Pl. 465.* Houseleek with entire Leaves and spreading Offsets. *Sedum montanum majus foliis non dentatis, floribus rubentibus. C. B. P. 283.* Greater Mountain Houseleek whose Leaves are not indented, and having red Flowers.

4. SEMPERVIVUM *foliis pilis intertextis, propaginibus globosis. Lin. Sp. Pl. 465.* Houseleek with Threads from Leaf to Leaf, and globular Offsets. *Sedum montanum tomentosum. C. B. P. 284.* Woolly Mountain Houseleek, commonly called Cobweb Sedum.

5. SEMPERVIVUM *caule arborecente levi ramoso. Lin. Sp. Pl. 464.* Houseleek with a smooth, Tree-like, branching Stalk. *Sedum majus arborecens. J. B. 3. 686.* Greater Tree Houseleek.

6. SEMPERVIVUM *caule foliorum rudibus lacero, foliis retusis. Lin. Sp. Pl. 474.* Houseleek with Stalks torn by the Rudiments of the Leaves, and blunt-pointed Leaves. *Sedum Canarinum, foliis omnium maximis. Hort. Amsl. 2. p. 189.* Canary Houseleek with the largest Leaves.

7. SEMPERVIVUM *foliorum marginibus serrato-dentatis, propaginibus patulis.* Houseleek with Leaves whose Borders are indented like a Saw, and spreading Offsets. *Sedum Afrum, montanum, foliis subrotundis, dentibus albis serratis confertim natis. Boerb. Ind. alt. 1. 286.* African Mountain Houseleek with roundish, indented, sawed Leaves having white Edges.

The 1st Sort is our common Houseleek, which is seen in every Part of England growing on the Tops of Houses and Walls, but is not a Native of this Country; it has many thick succulent Leaves set together in a round Form; they are convex on their Outside and plain within, sharp-pointed, and their Borders set with short fine Hairs. The Leaves spread open, and lie close to the Earth in which they grow, sending out on every Side Offsets of the same Form. From the Center of these Heads arises the Flower Stalk about a Foot high, succulent and round, of a reddish Colour, and garnished at Bottom with a few narrow Leaves; the upper Part of the Stalk divides into 2 or 3 Parts, each sustaining a Spike or Range of Flowers; and reflexed. The Flowers are composed of several Petals which spread open, and end in acute Points; they are red, and in the Center is situated the Crown of Germina which are placed circularly, and, after the Petals are fallen off, they swell and become so many horned Capsules filled with small Seeds. It flowers in July, and the Seeds ripen in Autumn.

This Plant is easily propagated by Offsets, which the Plants put out in Plenty on every Side. If these are planted in Mud or strong Earth placed on a Building or old Wall, they will thrive without farther Care.

The 2d Sort grows naturally in the northern Parts of Europe. The Leaves of this Sort are much narrower, and the Heads are furnished with a greater Number of Leaves than those of the former, which grow more compact, and are closely set on their Edges with Hairs. The Offsets of this are globular, their Leaves turning inward at the Top, and lie close over each other; these are thrown off from between the larger Heads, and falling on the Ground take Root, whereby it propagates very fast. The Flower Stalks of this, are smaller, and

do not rise so high as those of the former, and the Flowers are of a paler Colour.

The 3d Sort grows naturally on the *Helvetic* Mountains; this greatly resembles the first, but the Leaves are smaller and have no Indentures on their Edges; the Offsets of this Sort spread out from the Side of the older Heads, and their Leaves are more open and expanded. Out of the Center of the Crown comes forth the Flower Stalk, which rises 9 or 10 Inches high, garnished below with some narrow Leaves; the upper Part is divided into 3 or 4 Branches, closely furnished with deep red Flowers, composed of 12 Star-pointed Pointals, set round the Circle of Germina which is attended by 24 Stamina terminated by purple Summits. This flowers the same Time with the first Sort.

The 4th Sort grows naturally on the *Alps* and *Helvetic* Mountains; this has much shorter and narrower Leaves than either of the former. The Heads are small and very compact; the Leaves are gray, sharp-pointed, and have slender white Threads crossing from one to the other, intersecting each other in various Manner, so as in some Measure to represent a Spider's Web. The Flower Stalks rise about 6 Inches, are succulent, round, and garnished with Awl-shaped succulent Leaves placed alternately; the upper Part of the Stalk divides into 2 or 3 Branches, upon each of which is a single Row of Flowers ranged on one Side above each other, composed of 8 Spear-shaped Petals, of a bright red Colour with a deep red Line running longitudinally in the Middle; these spread open in Form of a Star, and in the Center is situated the Crown of Germina of an herbaceous Colour, surrounded by 16 purple Stamina, erect and spreading, terminated by yellow Summits. This Sort flowers in *June* and *July*.

All the above-mentioned Sorts are extremely hardy, and propagate very fast by Offsets; they love a dry Soil, so are very proper to plant in Rock Work, where they will thrive better than in the full Ground, and they want no Care, for when they are once fixed, they will propagate and spread fast enough, so that the larger Sorts require to be annually reduced to keep them within proper Bounds. When any of these Heads flower, they die soon after, but the Offsets soon supply their Place.

The 5th Sort grows naturally at the *Cape of Good Hope*, and also in *Portugal*; the old Walls about *Lisbon* are covered with this Plant. This rises with a fleshy smooth Stalk, 8 or 10 Feet high, dividing into many Branches terminated by round Heads or Clusters of Leaves lying over each other like the Petals of a double Rose; they are succulent and Spear-shaped, of a bright green, and have very small Indentures on their Edges like the Teeth of a very fine Saw. The Stalks are marked with the Vestiges of the fallen Leaves, and have a light brown Bark; the Flowers rise from the Center of the Heads, forming a large pyramidal Spike; they are of a bright yellow Colour, and the Petals spread open like the Points of a Star; the other Parts are like those of the other Species. This Sort generally flowers in Autumn or Winter, and the Flowers continue long in Beauty, during which Time they make a fine Appearance.

There is a Variety of this with variegated Leaves,

much esteemed by the curious; this was accidentally obtained by a Branch which had been accidentally broken from a Plant of the plain Kind at *Badmington*, the Seat of his Grace the Duke of *Beaufort*, which, after having lain some Time, was planted, and when the young Leaves pushed out, they were variegated. These Plants are easily propagated by cutting off the Branches, which, when planted, soon put out Roots; these should be laid in a dry Place for a Week before they are planted, that the Bottom may be healed over, otherwise they are apt to rot, especially if they have much Wet. When the Cuttings are planted in Pots, they should be placed in a shady Situation, and must have but little Wet, and, if they are planted in a shady Border, they will require no Water, for the Moisture of the Ground will be sufficient for them. Some Years past these Plants were tenderly treated; their Cuttings were put into a hot Bed to forward their putting out Roots, and in Winter the Plants were kept in Stoves, but later Experience has taught us that they will thrive better with harder Treatment; for, if they are protected from Frost and Wet in Winter, and have a good Share of Air in mild Weather, they will thrive better, and flower oftener than when they are tenderly nursed. I have frequently seen the Branches of these Plants, which have been accidentally broken off and fallen on the Ground, put out Roots as they have laid, and have made good Plants. The Sort with striped Leaves is tenderer than the other, and more impatient of Wet in Winter.

The 6th Sort grows naturally in the *Canary Islands*; this seldom rises high, unless the Plants are drawn up by tender Management. The Stalk is thick and rugged, chiefly occasioned by the Vestiges of the decayed Leaves; it seldom rises above a Foot and a Half high, supporting at the Top one very large Crown of Leaves disposed circularly like a full-blown double Rose. The Leaves are large, and end in obtuse Points a little incurved; they are succulent, soft to the Touch, and pliable. The Flower Stalk comes out of the Center, and rises near 2 Feet high, branching out from the Bottom, so as to form a regular Pyramid of Flowers, of an herbaceous Colour, and shaped like those of the other Species; they appear in *June* and *July*, and are succeeded by horned Capsules filled with small Seeds which ripen late in Autumn or Winter, and then the Plant dies.

This is propagated by Seeds, which should be sown soon after it is ripe in Pots filled with light sandy Earth, covering them over very lightly with the same Earth. These Pots should be placed under a common Frame to keep out the Frost, but should be exposed to the open Air at all Times in mild Weather; here the Pots may remain till the Spring, when the Danger of hard Frosts is over, and then they should be removed to a Situation where they may have only the Morning Sun, and in dry Weather the Earth should be watered gently. This will soon bring up the Plants, which must be kept clean from Weeds, and, when they are fit to remove, they should be planted in Pots filled with light loamy Earth, and placed in the Shade till they have taken new Root; then they may be placed with other hardy succulent Plants in a sheltered Situation for the Summer, and in Winter they are placed in a Frame

where they may be protected from hard Frost, and enjoy the free Air in mild Weather; they will thrive better than with tender Treatment.

The 7th Sort grows naturally at the Cape of Good Hope; this is a very low Plant whose Heads spread close on the Ground; they are much smaller than those of the common Houseleek. The Leaves have white Edges indented like the Teeth of a Saw; they spread open flat; the Flowers are produced in loose Panicles on naked Foot Stalks; they are small and white, so make but little Appearance.

This is propagated by Offsets, which are put out in Plenty from the Sides of the Heads; they must be planted in Pots, sheltered from the Frost in Winter, and in Summer placed in the open Air with other hardy succulent Plants.

SENECIO. Tourn. Inst. R. H. 456. Tab. 260. Lin. Gen. Pl. 857. Groundsel; in French, *Senecion*.

The Characters are,

The Flower is composed of many hermaphrodite Florets which form the Disk, and female half Florets which make the Border or Rays; these are included in one common cylindrical Empalement which is rough, scaly, and contracted above. The hermaphrodite Florets are tubulous, Funnel-shaped, and cut into 5 Parts at the Brim which are reflexed; they have 5 small Hair-like Stamina terminated by cylindrical Summits, and an oval Germen crowned with Down situated under the Petal, supporting a slender Style crowned by 2 oblong revolving Stigmas. The Germen turns to an oval Seed, crowned with Down, inclosed in the Empalement. The female-half Florets, which form the Rays, are stretched out like a Tongue, and are indented in three Parts at the Top.

We shall not trouble the Reader with mentioning those Species of this Genus, which are esteemed common Weeds, so are not cultivated in Gardens, but confine ourselves to those the most valuable here.

1. SENECIO corollis nudis, foliis amplexicaulibus lacertis, caule herbaceo erecto. Hort. Upsal. 261. Groundsel with naked Petals, torn Leaves embracing the Stalk, and an erect herbaceous Stalk. Senecio Americanus altissimus, maximo folio. Tourn. Inst. 456. Tallest American Groundsel with a very large Leaf.

2. SENECIO corollis nudis, scapo subnudo longissimo. Flor. Leyd. Prod. 164. Groundsel with naked Florets, and a very long Foot Stalk almost naked, Senecio Madraspatanus, rapi folio, floribus maximis cujus radix à nonnullis China dicitur. Hort. Elth. 345. Groundsel of Madras, with a Turnip Leaf and a very large Flower, whose Root is called China Root.

3. SENECIO corollis radiantibus, foliis crenatis, infimis cordatis petiolatis, superioribus pinnatifidis lyratis. Flor. Virg. 98. Groundsel with radiated Flowers, and crenated Leaves, the Lower ones Heart-shaped, having Foot Stalks, but the upper Lyre-shaped and Wing-pointed.

4. SENECIO corollis radiantibus, petiolis amplexicaulibus, pedunculis folio triplo longioribus, foliis pinnato sinuatis. Flor. Leyd. Prod. 164. Groundsel with radiated Flowers, Foot Stalks embracing the Stalks, Foot Stalks to the Flowers three Times the Length of the Leaves, and winged sinuated Leaves. Jacobaea Afra. perennis viscosa lutea, asplenii folio. Paill. Act. 1720. African,

perennial, 'yellow, clammy Ragwort with a Spleenwort Leaf.

5. SENECIO corollis radiantibus, foliis pinnatifidis æqualibus patentissimis, rachi infernè angustata. Hort. Cliff. 406. Groundsel with radiated Flowers, Wing-pointed Leaves equal and spreading, and the Mid-rib below narrowed. Jacobaea Africana frutescens, flore amplo purpureo elegantissimo, senecionis folio. Volk. Norimb. 225. Shrubby African Ragwort with a large elegant purple Flower, and a Groundsel Leaf.

6. SENECIO corollis radiantibus, foliis pinnato-multifidis linearibus. Lin. Sp. Pl. 869. Groundsel with radiated Flowers, and Wing-pointed, multifid, linear Leaves. Jacobaea foliis ferulaceis, flore minore. Inst. R. H. 486. Ragwort with Leaves like Giant Fennel, and a smaller Flower.

7. SENECIO corollis radiantibus, foliis ensiformibus acutè serratis subtus subvillosis, caule stricto. Lin. Sp. Pl. 870. Groundsel with radiated Flowers, Sword-shaped Leaves acutely sawed, a little hairy on their under Side, and a close Stalk. Jacobaea palustris altissima, foliis serratis. Tourn. Inst. 485. Tallest Marsh Ragwort with sawed Leaves.

8. SENECIO corollis radiantibus, floribus corymbosis, foliis lanceolatis serratis glabriusculis. Hort. Upsal. 266. Groundsel with radiated Flowers growing in a Corymbus, and Spear-shaped, sawed, smooth Leaves. Jacobaea Alpina, foliis longioribus serratis. Tourn. Inst. 485. Alpine Ragwort with longer sawed Leaves.

9. SENECIO corollis radiantibus, floribus corymbosis, foliis lanceolatis serratis semiamplexicaulibus. Groundsel with radiated Flowers growing in a Corymbus, and Spear-shaped sawed Leaves half embracing the Stalks. Jacobaea pratensis altissima, limonii folio. Tourn. Inst. 485. Tallest Meadow Ragwort with a Sea Lavender Leaf.

10. SENECIO corollis radiantibus, floribus corymbosis, foliis ensiformibus dentatis semiamplexicaulibus. Groundsel with radiated Flowers growing in a Corymbus, and Sword-shaped indented Leaves which half embrace the Stalks. Jacobaea orientalis, latifolia altissima. Tourn. Cor. 36. Tallest eastern Ragwort with a broad Leaf.

11. SENECIO corollis radiantibus, floribus corymbosis, foliis inferioribus oblongo-cordatis serratis, caulibus lanceolatis integerimis amplexicaulibus. Groundsel with radiated Flowers growing in a Corymbus, the lower Leaves oblong, Heart-shaped, and sawed, and those on the Stalks Spear-shaped, entire, and embracing the Stalks.

12. SENECIO corollis radiantibus, foliis utrinque tomentosis semipinnatis laciniis subdentatis, corymbo subrotundo. Haller. Helv. 731. Groundsel with radiated Flowers, half-winged Leaves downy on both Sides, Segments somewhat indented, and a roundish Corymbus of Flowers. Chrysanthemum Alpinum incanum, foliis laciniatis. C. B. P. 133. Alpine hoary Corn Marygold with cut Leaves

13. SENECIO corollis radiantibus, foliis cordato-oblongis amplexicaulibus scabris acuminatis serratis, caule fruticoso. Hort. Cliff. 406. Groundsel with radiated Flowers, oblong, Heart-shaped, rough-pointed, sawed Leaves embracing the Stalks which are shrubby Jacobaea Africana frutescens, foliis rigidis & hirsutis. Hort. Amst. 2. p. 149. Shrubby African Ragwort with stiff and hairy Leaves.

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14. *SENECIO corollis radiantibus, foliis sagittatis amplexicaulis dentatis, caule fruticoso. Vir. Cliff. 84.* Groundfel with radiated Flowers, and Arrow-pointed indented Leaves embracing the Stalks which are shrubby. *Jacobæa Africana frutescens, foliis incis & subtus cinereis. Com. Rar. Plant. 42.* African shrubby Ragwort with cut Leaves gray on their under Side.

15. *SENECIO corollis radiantibus, foliis obovatis carnosius subdentatis, caule fruticoso. Lin. Sp. Pl. 871.* Groundfel with radiated Flowers; oval fleshy Leaves somewhat indented, and a shrubby Stalk. *Doria Africana arbore-scens foliis crassis & succulentis atriplicem referentibus. Boerb. Ind. alt. 1. p. 98.* African Tree-like *Doria* with thick and succulent Leaves like *Atriplex*.

16. *SENECIO corollis nudis, foliis linearibus hirsutis confertis, caule suffruticoso.* Groundfel with naked Flowers, linear hairy Leaves growing in Clusters, and an Under-shrub Stalk. *Senecio Africanus, folio retuso. H. Cath. African* Groundfel with a blunt-pointed Leaf

17. *SENECIO corollis radiantibus, floribus corymbosis foliis ensiformibus integerrimis glabris sessilibus.* Groundfel with radiated Flowers growing in a Corymbus, and Sword-shaped, entire, smooth Leaves sitting close to the Stalks. *Jacobæa orientalis, limonii folio. Tourn. Car. 36.* Eastern Ragwort with a Sea Lavender Leaf.

The 1st grows naturally in *North America*; this is an annual Plant. The Stalk is round, channeled, and hairy; it rises 3 Feet high, and is garnished with torn Leaves which embrace the Stalks with their Base; the Flowers are produced in a Sort of Umbel on the Top of the Stalks, and are composed of Florets having no Rays; they are of a dirty white, and are succeeded by oblong Seeds crowned with a long Down. This Plant is preserved in some Botanick Gardens for Variety, but it has little Beauty. The Seeds of this must be sown on a hot Bed in the Spring, and when the Plants are fit to remove, they should be transplanted to another hot Bed to bring them forward, and afterward they may be planted in a warm Border, where they will flower in *July*, and their Seeds will ripen in Autumn.

The 2d Sort grows naturally at *Madras*; this has a perennial Root, which has been supposed to be the *China* Root, but is now generally believed to be a spurious Kind. The Roots are composed of some thick fleshy Tubers, sending out many Fibres on every Side, from which come out some large cut Leaves shaped like those of the Turnep, but smooth. The Flower Stalk is slender, almost naked, and rises a Foot and a Half high, sustaining at the Top a few yellow Flowers, composed of several hermaphrodite Florets, having no Rays or Borders; these are succeeded by oval Seeds crowned with Down, but they rarely ripen in *England*.

This Sort is tender, so will not thrive in this Country, unless kept in a warm Stove; it is propagated by parting the Roots in Spring. The Offsets should be planted in pots filled with light Kitchen Garden Earth, and should then be plunged into the Tan Bed in the Stove, and treated as other tender Exoticks.

The 3d Sort grows naturally in *North America*; this hath a perennial Root, from which come out many roundish Leaves on long slender hairy Foot Stalks; they

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are about an Inch and a Half over each Way; they are of a purplish Colour on their under Side, and crenated on their Edges. The Stalks rise near 2 Feet high, and are garnished with a few Leaves indented on each Side in Form of a Lyre. The upper Part of the Stalk divides into several slender long Foot Stalks, each sustained one erect Flower composed of several hermaphrodite Florets in the Center, and a few female Florets from the Rays or Border. They are yellow, and appear in *June* and *July*, and the Seeds ripen in Autumn, and are crowned with Down.

It is propagated by Offsets which come out in Plenty from the Root; these may be separated in Autumn, and planted in an East Border of loamy Earth, allowing each Plant 2 Feet Room to spread. When they have taken new Root, they will require no other Care, but to keep them clean from Weeds.

The 4th Sort grows naturally in *Africa*; this has an herbaceous perennial Stalk which branches out at the Bottom, and rises about 2 Feet and a Half high, garnished at Bottom with narrow Leaves, 7 or 8 Inches long, sinuated on the Sides so as to resemble winged Leaves, and indented. The upper Leaves are smaller, and embrace the Stalks; they are very clammy, and stick to the Fingers on being handled; the upper Part of the Stalk divides into several very long Foot Stalks, each sustaining one yellow radiated Flower. These Plants continue in flower most part of the Summer, and the Seeds sometimes ripen in Autumn.

This is propagated by cutting off the Side Shoots in any of the Summer Months, and planting them in a shady Border, where in 5 or 6 Weeks they will take Root, and may then be taken up, and planted in Pots, placing them in the Shade till they have new Root; then they may be removed to an open Situation, observing to water them duly in dry Weather, and in Winter they must be placed under a Frame, where they may be screened from hard Frost, for they will not live Abroad in Winter here.

The 5th Sort grows naturally at the *Cape of Good Hope*; it is an annual Plant, which hath many herbaceous branching Stalks that rise near 3 Feet high, garnished with equal Wing-pointed Leaves which spread flat. The Flowers are produced in Bunches on the Top of the Stalks; they are large and radiated, the Border or Rays being of a beautiful purple Colour, and the Middle or Disk yellow. These Plants flower from *July* till the Frost stops them, and make a fine Appearance. The Seeds ripen in Autumn, which, if permitted to scatter, there will Plenty of Plants rise the Spring following without Care; they may be also sown on a Bed of Earth in the Spring, and when the Plants are fit to remove, they may be transplanted about the Borders of the Flower Garden. If some of the Plants are planted in Pots, and housed in Winter, they may be preserved till Spring.

The 6th Sort grows naturally on the *Alps* and *Pyrenees*; this has a perennial Root and an annual Stalk. The Root is composed of a great Number of long slender Fibres which strike deep in the Ground, and spread on every Side; the Stalks rise 2 Feet high, and become a little ligneous in Autumn; they are garnished their whole Length with very narrow Wing-pointed

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Pointed Leaves resembling those of Hogs Fennel; the Flowers are produced in Bunches on the Top of the Stalks; they are yellow, and have Rays or Borders resembling those of the other Species. This Sort flowers in *June* and *July*, and the Seeds ripen in Autumn.

It is propagated by Seeds, which should be sown on a Bed of loamy Earth, where it is exposed only to the Morning Sun, where the Plants will rise better than in a warmer Situation. When the Plants are fit to remove, they may be transplanted on a shady Border, where they may remain till Autumn, observing to keep them clear from Weeds all the Summer; then they should be transplanted to the Places where they are to remain. The following Summer the Plants will flower and produce ripe Seeds, and the Roots will continue, if they are in a shady Situation and a loamy Soil.

The 7th Sort grows naturally about *Paris*, by the Sides of Waters and in moist Meadows. The Root is perennial; the Stalks rise 3 or 4 Feet high, are close channeled, and garnished with Sword-shaped Leaves, 5 or 6 Inches long and one broad, sharply sawed on their Edges, and hairy on their under Side. The upper Part of the Stalk divides into several slender Foot Stalks, sustaining yellow radiated Flowers which appear in *June* and *July*, and the Seeds ripen in Autumn, soon after which the Stalks decay to the Root.

The 8th Sort grows naturally on the *Helvetian* Mountains, and is sometimes found growing in low marshy Places in the Isle of *Ely*; this hath a creeping Root, by which it propagates and spreads wide wherever it is once established. The Stalks rise 4 Feet high, and are garnished with smooth Spear-shaped Leaves 5 Inches long, and one and a Quarter broad; they are sawed on their Edges, and placed alternate. The Flowers are yellow, radiated, and produced in a Sort of Corymbus on the Top of the Stalk; these come out in *July*, and are succeeded by Seeds having Down, which ripen in Autumn.

The 9th Sort grows naturally in *France*; this has some resemblance of the 8th, but the Root does not creep like that. The Leaves are shorter, and the Seratures on their Edges are very small; they embrace the Stalks with their Base, and end in sharper Points. The Flowers are produced in larger and looser Bunches on the Top of the Stalk, are of a paler yellow Colour than those of the former, and appear about the same Time.

The 10th Sort grows naturally in the *Levant*, where it was discovered by Dr. *Tournefort*, who sent the Seeds to the Royal Garden at *Paris*; it has a perennial Root and an annual Stalk. The lower Leaves are a Foot long, 4 Inches broad in the Middle, and somewhat shaped like a Scymiter, the Mid-rib being curved outward toward the Point; they are smooth and slightly indented on their Edges. The Stalk rises 4 Feet high, and is garnished with Leaves growing smaller all the Length of the Stalk, which Embrace it half round with their Base; at the Top of the Stalk the Flowers are produced in a compact Corymbus; they are of a deep yellow, and have Rays like those of the former Sorts, which appear about the same Time.

These Sorts are easily propagated by Seeds or parting their Roots; the latter is generally practised when the Plant is once obtained, as it is the most expeditious

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Method, especially for the eighth Sort, whose Roots are apt to spread and increase too fast, where they are not confined. The best Time to transplant and divide these Roots is in Autumn, when their Stalks decay, that they may get good before the Spring. These plants are too large for small Gardens, so are proper Furniture for large Borders in extensive Gardens, or to plant on the Sides of Woods, where they may be allowed Room, for they should have at least 4 Feet allowed to each. When these are intermixed with other tall growing Plants in such places, they will add to the Variety.

If propagated by Seeds, they should be sown on a shady Border in the Spring, observing, if the Season proves dry, to water the Place from Time to Time, which will bring up the Plants; these must be kept clean from Weeds, and, when they are fit to remove, they should be transplanted into Beds at a Foot Distance, where they may remain till Autumn, and then they should be transplanted to the Places where they are to stand for flowering.

The 11th Sort grows naturally in *North America*; this has a perennial Root, from which come out Heart-shaped Leaves, 9 Inches long, and 5 broad in the widest Part, which are smooth, slightly indented on their Edges, and a little downy on their under Side. The Stalks rise 3 Feet high, and is garnished with Spear-shaped entire Leaves embracing the Stalks; the Flowers are produced in a close compact Corymbus at the Top of the Stalk; they are of a deep yellow, radiated, appear the End of *July* and in *August*, and are succeeded by seeds which ripen in Autumn. This Sort is propagated as the former, and is equally hardy.

The 12th Sort grows naturally on the *Alps*; this is a perennial Plant of low growth. The Stalks seldom rise a Foot high; the whole Plant is covered with a very white hoary Down; the Leaves are winged and indented; the Flowers are collected into a close round Corymbus on the Top of the Stalk; they are of a Gold Colour, and are radiated; these appear in *June*, but are rarely succeeded by good Seeds in *England*.

It is propagated by slipping off the Heads in the Spring, and planting them in a Bed of loamy Earth in a shady Situation, where they will put out Roots, and may afterward be transplanted into an East Border, where they may have the Morning Sun only, for this Plant loves a gentle loamy Soil, and a Situation not too much exposed to the Sun. This Plant, having fine hoary Leaves, will make a pretty Diversity when intermixed with other Plants, and, as it requires but little Culture, and takes up little Room, it deserves a Place in small Gardens.

The 13th Sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby branching Stalk 6 or 7 Feet high, closely garnished with rough Leaves, whose Bases embrace the Stalks; those on the lower Part are 4 Inches long, and an Inch and a half broad but they gradually diminish in their Size to the Top; they are stiff, hairy, of a dark green, oblong, Heart-shaped, and indented on their Edges. The Flowers are produced at the End of the Branches; they are radiated, and of a bright yellow Colour. This Plant continues flowering

flowering great Part of the Summer, and the Seeds ripen in Autumn.

The 14th Sort grows naturally at the *Cape of Good Hope*; this hath a very branching shrubby Stalk, which rises 4 or 5 Feet high, sending out Branches irregularly on every Side garnished with Stiff Leaves whose Bases embrace the Stalks; they are irregular in their Figure, about 3 Inches long, and three Quarters of an Inch broad, deeply cut on their Edges, and of a gray Colour on their under Side. The Flowers grow in loose Bunches at the End of the Branches, are radiated, and of a pale yellow Colour. This Sort flowers great Part of Summer, and the Seeds ripen in Autumn.

The 15th Sort grows naturally at the *Cape of Good Hope*; this has a shrubby Stalk, which rises 7 or 8 Feet high, sending out Branches on every Side the whole Length, garnished with oblong oval Leaves indented on their Edges; they are about two Inches and a Half long, and almost 2 broad, fleshy, and hoary. The Flowers are produced in loose Bunches at the Extremity of the Branches, almost in Form of an Umbel; they are radiated, and of a pale yellow Colour. This Sort flowers in July and August, but rarely produces good Seeds here.

The 16th Sort grows naturally at the *Cape of Good Hope*, but has been long an Inhabitant in the *English Gardens*. This is a perennial Plant, from whose Roots arise several hairy herbaceous Stalks 4 Feet high, which send out small Branches from their Sides, garnished with hairy linear Leaves, 2 Inches long and a Quarter of an Inch broad toward their Points; they come out in Clusters without Order, and sit close to the Branches; they are a deep green on their upper Side, and pale on their under, these continue all the Year. The Flowers are produced at the End of the Branches in close Bunches, formed like Umbels; they are of a Gold Colour, but have no Rays or Borders, only hermaphrodite Florets which are included in one common Empalement. These appear late in Autumn, and continue great part of Winter, and the Seeds ripen in the Spring.

The four Sorts last mentioned are too tender to live in the open Air through the Winter in *England*, but are so hardy as to only require Protection from hard Frosts; so they are kept in Pots and placed either under a Frame in Winter, or in a common Green-house with other hardy Kinds of Plants, which require a large Share of Air in mild Weather, and only require to be screened from hard Frost. They are all easily propagated by Seeds or Cuttings, but the latter being the most expeditious Method is generally practised here. If the Cuttings are planted in a shady Border during any of the Summer Months, they will readily take Root, and then they should be taken up with Balls of Earth to their Roots, and each planted in a separate Pot filled with good Kitchen Garden Earth, and placed in the Shade till they have taken new Root; then they may be removed to a more open Situation, where they may remain till there is Danger of sharp Frost, when they should be removed into shelter, and treated as other hardy Kinds of Green-house Plants.

If these Plants are propagated by Seeds, they should be sown on a Bed of fresh Earth, exposed only to the Morning Sun the Beginning of *April*, observing in dry

Weather to moisten the Ground now and then, which will forward the Vegetation of the Seeds. When the Plants come up, they must be kept clean from Weeds till they are fit to remove, when they should be planted in Pots, and treated as those raised from Cuttings.

The 17th Sort was discovered by Dr. *Tournefort*, growing naturally in the *Levant*, from whence he sent the Seeds to the Royal Garden at *Paris*. This has a perennial Root and an annual Stalk; the lower Leaves are 8 or 9 Inches long, and almost 3 broad; they are entire, smooth, and of a lucid green, having a broad whitish Mid-rib. The Stalks rise 7 or 8 Feet high, and are garnished with Sword-shaped Leaves like those below, which diminish in Size to the Top of the Stalk; they are placed alternately round the Stalks to which they sit close, having no Foot Stalks. The Stalks divide at the Top into several Foot Stalks, which sustain yellow Flowers, that have 4 or 5 female Florets on their Borders forming the Rays, and the Disk is composed of hermaphrodite Florets, which are succeeded by Seeds crowned with Down. This flowers in July, and the Seeds ripen in Autumn.

This Plant is propagated either by Seeds or parting the Roots, same Way as the tenth, eleventh, and twelfth Sorts, and the Plants may be treated as hath been directed for those.

SENNA. *Tourn. Inst. R. H.* 618. *Tab.* 390. *Cassia. Lin. Gen.* 461. *Senna.*

The Characters are,

The Flower has an Empalement of 5 concave Leaves; it has 5 roundish concave Petals which spread open, and 10 declining Stamina, terminated by oblong arched Summits. The Germen is roundish and compressed, supporting a short Style, crowned by an obtuse Stigma. The Germen becomes a plain, roundish, compressed Pod, a little incurved, having 2 Cells divided by an intermediate Partition, each containing 1 or 2 oblong pointed Seeds.

The Species are,

1. SENNA *foliolis quadrijugatis lanceolatis acutis* Senna with 4 Pair of Spear-shaped pointed Lobes to the Leaves. *Senna Alexandrina* *five foliis acutis. C. B. P.* *Alexandrian Senna* with acute Leaves.

2. SENNA *foliolis quinquejugatis cordatis obtusis. Senna* with 5 Pair of Lobes to the Leaves, which are Heart-shaped and obtuse. *Senna Italica* *five foliis obtusis. C. B. P.* 397. *Italian Senna* with obtuse Leaves.

The 1st Sort grows naturally in *Egypt*; this is an annual Plant, which rises with an upright branching Stalk about a Foot high, garnished with winged Leaves composed of 4 Pair of small Spear-shaped Lobes, ending in acute Points. The Flowers are produced in loose Bunches at the Top of the Stalk, they are yellow, composed of 5 roundish concave Petals, with 10 Stamina in the Center surrounding the Style; after the Flower is past, the Germen turns to a roundish gibbous Pod having 2 Cells, each containing 1 or 2 oblong Seeds. The Leaves of this Sort are used in Medicine, and are commonly known in the Shops by the Title of *Senna*; these are annually imported from *Alexandria*, which occasioned the Title of *Alexandrina* being added to it. This Plant is propagated by Seeds, which should be sown early in the Spring, upon a good hot Bed; and when the Plants are come up, and are strong enough

to transplant, they should be each planted in a small Pot filled with light rich Earth, and plunged into a fresh hot Bed, shading them from the Sun till they have taken new Root, after which they must be treated as the most tender Exoticks; for as this is an annual Plant, unless they are brought forward in the Spring, they will not flower in this Country; therefore they must be constantly kept in the hot Bed all the Summer, observing to admit Plenty of Air in warm Weather; by which Method I have frequently had these Plants in flower, but it is very rare that they perfect their Seeds in England.

If the Seeds of this Plant were sent to South Carolina, the Plants might be propagated there, so as to furnish Plenty of the Leaves, to supply the Consumption of Great-Britain.

In the *West-Indies*, the Inhabitants make Use of the Leaves of several Species of Cassia, instead of this Plant; and also of those of the *Poinciana*, or Flower Fence, which is frequently by them called the true *Senna*.

The 2d Sort grows naturally in *India*, from whence I have received the Seeds; for although it is called *Italian*, yet the Plant does not grow there naturally. This is also an annual Plant, rising with a branching Stalk a Foot and a Half high; the Leaves are winged, each having 5 Pair of Heart-shaped Lobes inverted, the Point joining the Branches, and the obtuse Part is upward; they are of a Sea green Colour, and of a thick Consistence. The Flowers are produced at the End of the Branches, they are shaped like those of the first Sort, but are larger and of a brighter yellow Colour. If the Plants are brought forward early in the Spring, they will flower in *July*, and by so doing good Seeds may be obtained here. This Sort is propagated as the first, and the Plants require the same Treatment.

The Leaves of this Sort have been sometimes used in Medicine, but they are not esteemed equal in Quality with those of the first.

SENNA THE BLADDER. See *Colutea*.

SENNA THE SCORPION. See *Emerus*.

SENSIBLE PLANT. See *Mimosa*.

SEPTIFOLIUS PLANTS, are such as have just seven Leaves.

SERAPIAS. *Lin. Gen. Pl.* 903. *Helleborine. Tourn. Inst. R. H.* 436. *Tab.* 249. Bastard Hellebore.

The Characters are,

It has a single Stalk; the Sheath of the Flower is at a Distance. The Germen sustains the Flower which has no Empalement, but has 5 oblong oval Petals, which are spreading, but close at the Top. The Nectarium is the Length of the Petal, hollowed at the Base, oval, and gibbous below, cut into 3 Points, the Middle being Heart-shaped and obtuse, the others are acute. The Flower has 2 short Stamina sitting upon the Pointal, terminated by erect Summits, placed under the upper Lip of the Nectarium; and an oblong contorted Germen, situated under the Flower, the Style growing to the upper Lip of the Nectarium, crowned by an obsolete Stigma. The Germen afterward becomes an oval, obtuse, three-cornered Capsule, armed with 3 Keels, opening with a Valve under each, having 1 Cell filled with small Seeds.

The Species are,

1. SERAPIAS bulbis fibrosis, nectararii labio obtuso crenato petalis brevioribus. *Aët. Upsal.* 1740. *Serapias* with fibrous Bulbs, and the Lip of the Nectarium obtuse, crenated, and shorter than the Petal. *Helleborine montana latifolia. C. B. P.* 186. Broad-leaved Mountain Bastard Hellebore.

2. SERAPIAS bulbis fibrosis, petalis nectario longioribus obtusis, foliis lanceolatis nervosis. *Serapias* with fibrous Bulbs, obtuse Petals longer than the Nectarium, and veined Spear-shaped Leaves. *Helleborine flore albo vel Damasonium montanum latifolium. C. B. P.* 187. Bastard Hellebore with a white Flower, or broad-leaved Mountain *Damasonium*.

3. SERAPIAS bulbis fibrosis, petalis reflexis, nectararii labio obtuso, foliis ensiformibus nervosis. *Serapias* with fibrous Bulbs, reflexed Petals, the Lip of the Nectarium obtuse, and Sword-shaped veined Leaves. *Helleborine angustifolia, palustris, five pratensis. C. B. P.* 187. Narrow-leaved Marsh, or Meadow Bastard Hellebore.

4. SERAPIAS bulbis fibrosis, nectararii labio quinquefido clauso, foliis lanceolatis nervosis amplexicaulibus. *Serapias* with fibrous Bulbs, the Lip of the Nectarium cut into 5 Parts and closed, and Spear-shaped veined Leaves embracing the Stalks. *Helleborine latifolia, flore albo clauso. Raii Syn.* 2. 242. Broad-leaved Bastard Hellebore, with a white closed Flower.

There are some other Species of this Genus which grow naturally in *Great-Britain* and *Ireland*, but as I have not had the good Fortune to meet with them, I shall not trouble the Reader with an imperfect Account of them from Books; there are also a greater Number of them which grow naturally in the *West-Indies* of which I have Samples in my Collection; but having never seen any growing Plants of them, I shall not insert them here.

The 1st Sort grows naturally in Woods and shady Places in many Parts of *England*; the Roots are composed of many thick fleshy Fibres, from which arises a single Stalk a Foot high and jointed; it is garnished at each Joint with one veined Leaf, those on the lower Part of the Stalk are oval, but those above are Spear-shaped, ending in acute Points; they embrace the Stalks at their Base. The Stalk is adorned with Flowers toward the Top, which have some Resemblance to those of *Orchis*; they are composed of 2 whitish, and 3 herbaceous Petals, which expand, and in the Middle appears the Nectarium, which has a Resemblance of a disboweled Body of a Fly, of a purplish Colour. Under the Flower is situated a channeled oblong Head, which after the Flower is past, swells and becomes a Seed Vessel filled with very small Seeds. This flowers in *June* and *July*, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in *Stoken Church Woods* in *Oxfordshire*, and in several Parts of *Westmoreland* and *Lancashire*. This has fleshy fibrous Roots, not quite so thick as those of the former; the Stalks rise more than a Foot high, and are garnished with Spear-shaped veined Leaves, ending in acute Points; they are 3 Inches long and 1 broad, of a lucid green, and sit close to the Stalk. The Flowers are disposed alternately on the upper Part of the Stalk, they are white, and have 3 outer Petals which are large, and two smaller within;

within; in the Center is situated the gaping Nectarium, which appears to have 2 Wings: This Sort flowers about the same Time as the former.

The 3d Sort grows naturally in marshy Woods in many Parts of England; this has a fleshy fibrous Root, from which arises a single Stalk a Foot and a Half high, garnished at Bottom with Sword-shaped veined Leaves, 4 Inches long and 1 broad, embracing the Stalk with their Base, and ending in acute Points. The upper Part of the Stalk is garnished with faded purplish coloured Flowers disposed in a loose Spike; they have 5 Petals, inclosing a large Nectarium like the Body of a Fly, with a yellowish Head striped with purple and a white Body; the Lip which hangs down, is white and fringed on the Edge. This Sort flowers in July.

The 4th Sort was discovered first in Hertfordshire, but since it has been found growing in many other Places. The Root is composed of fleshy Fibres, the Stalks rise more than a Foot high, and are garnished with Spear-shaped veined Leaves, which embrace the Stalks with their Base. The Stalk is terminated by a loose Spike of white Flowers, composed of 5 Petals, and a large 5 pointed Nectarium which is shut; the Germen is oblong and channelled, this becomes a Capsule of the same Form, filled with small Seeds. It flowers in July.

These Plants are rarely kept in Gardens, and being difficult to propagate, there are few who have attempted to keep them in Gardens. They may be taken up from the Places where they naturally grow, when their Leaves begin to decay, and planted in a shady moist Place where they will thrive and flower.

SERJANIA. See Paullinia.

SERPENTARIA. See Aristolochia.

SERPILLUM. See Thymus.

SERRATULA. Dillen. Nov. Gen. 8. Lin. Gen. Pl. 831. Jacea. Tourn. Inst. R. H. 444. Saw-wort.

The Characters are,

The Flowers are composed of many hermaphrodite Florets, contained in 1 common cylindrical Empalement, which is bellied, and the Scales are Spear-shaped, ending in acute Points. The hermaphrodite Florets are equal, Funnel-shaped, and of one Petal. The Tube is inflexed, the Brim is bellied, and cut into 5 Points; they have each 5 short Hair-like Stamina, terminated by cylindrical Summits; and an oval crowned Germen, supporting a slender Style, crowned by 2 oblong reflexed Stigmas. The Germen afterward turns to a vertical, oval, single Seed, crowned with Down, which ripens in the Empalement.

The Species are,

1. SERRATULA foliis pinnatifidis, pinna terminali maxima. Hort. Cliff. 391. Saw-wort with Wing-pointed Leaves, whose End Lobe is the largest. Serratula. C. B. P. 235. Common Saw-wort.

2. SERRATULA foliis lanceolato-oblongis serratis subtus tomentosis. Saw-wort with oblong Spear-shaped Leaves which are sawed, and downy on their under Side. Serratula Novboracensis, altissima, foliis Dorie mollioribus subincanis. Par. Bat. Prod. Tallest New England Saw-wort, with soft Doria Leaves, hoary on their under Side.

3. SERRATULA foliis ovato-oblongis acuminatis serratis, floribus corymbosis, calycibus subrotundis. Flor. Virg.

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92. Saw-wort with oblong, oval, acute-pointed, sawed Leaves, and Flowers in a Corymbus whose Empalements are roundish. Serratula Virginiana, foliis rigidis. Par. Bat. Prod. 227. Virginian Saw-wort with stiff Leaves.

4. SERRATULA foliis linearibus, calycibus squarrosis sessilibus acuminatis. Hort. Cliff. 392. Saw-wort with linear Leaves and rough Empalements which sit close to the Stalks, ending in acute Points. Cirsium tuberosum, capitulis squarrosis. Hort. Elth. 83. Tuberous melancholy Thistle with rough Heads.

5. SERRATULA foliis lanceolatis integerrimis, calycibus squarrosis pedunculatis obtusis lateralibus. Lin. Sp. Pl. 818. Saw-wort with entire Spear-shaped Leaves, and rough Empalements, having obtuse Foot Stalks proceeding from the Side of the Stalks. Jacea latifolia Virginiana, radice tuberosa. Banist. Cat. Broad-leaved Virginian Knapweed with a tuberous Root.

6. SERRATULA foliis linearibus, floribus sessilibus lateralibus spicatis, caule simplici. Lin. Sp. Pl. 819. Saw-wort with linear Leaves, Flowers in Spikes from the Side of the Stalks sitting close, and a single Stalk. Jacea non ramosa, tuberosa radice, floribus plurimis rigidis perangustis. Banist. Cat. 1927. Unbranched Knapweed with a tuberous Root, and many narrow rigid Flowers.

7. SERRATULA foliis lanceolatis rigidis, acuta serratis, caule corymbofo. Saw-wort with stiff Spear-shaped Leaves sharply sawed, and Stalks forming a Corymbus. Serratula Caroliniensis, virga pastoris folio. Hort. Elth. 353. Carolina Saw-wort with a Shepherd's Rod Leaf.

8. SERRATULA foliis oblongo-lanceolatis, integerrimis subtus hirsutis. Saw-wort with oblong Spear-shaped entire Leaves, hairy on their under Side. Serratula Virginiana, persica folio subtus incano. Hort. Elth. 356. Virginian Saw-wort with a Peach Tree Leaf, hoary on the under Side.

9. SERRATULA foliis oblongo-ovatis obtuse-dentatis, caule ramoso patulo, calycibus subrotundis mollioribus. Saw-wort with oblong oval Leaves bluntly indented, a branching spreading Stalk, and soft roundish Empalements.

10. SERRATULA calycibus subhirsutis ovatis. Lin. Sp. Pl. 816. Saw-wort with oval Empalements a little hairy. Cirsium humile montanum cynoglossi folio polyanthemum. Mor. Hist. 3. p. 148. Low Mountain melancholy Thistle, with a Hound's Tongue Leaf, and many Flowers.

11. SERRATULA calycibus oblongo-ovatis, squamis subulatis acutis, foliis pinnatis, foliolis obtusis serratis. Saw-wort with oblong oval Empalements, having sharp-pointed Awl-shaped Scales, and winged Leaves whose Lobes are blunt-pointed and sawed. Jacea annua, foliis laciniatis purpurascens flore. Tourn. Inst. 444. Annual Knapweed with cut Leaves and a purplish Flower.

12. SERRATULA calycibus oblongo-ovatis, squamis subulatis acutis, foliis pinnatis, foliolis linearibus pinnato-serratis. Saw-wort with oblong oval Empalements, having acute-pointed Awl-shaped Scales, and winged Leaves with linear Lobes, sawed like Wings. Serratula annua seminibus nitidissimis ad basin compressis. Act. Phil. Lond. 395. Annual Saw-wort with neat Seeds compressed at their Base.

The 1st Sort grows naturally in moist Woods and

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Marshes

Marishes in many Parts of *England*, so is rarely admitted into Gardens. There are 2 Varieties of this one with a white, and the other a purple Flower. The Root is perennial; the lower Leaves are sometimes entire, and others are cut almost to the Mid-rib into many Jags; they are smooth, of a deep green, and neatly sawed on their Edges. The Stalks rise 2 Feet high, and are garnished with Wing-pointed Leaves, whose extreme Lobe is much larger than the other, these are sawed on their Edges; the upper Part of the Stalk divides into several Foot Stalks, sustaining at the Top oblong squamous Heads or Empalements, which include several hermaphrodite Florets. These appear in *July*, and are succeeded by Seeds which ripen in Autumn.

The 2d Sort grows naturally in *North America*; this has a perennial Root, from which come out several channelled Stalks 7 or 8 Feet high, garnished with Spear-shaped Leaves from 4 to 5 Inches long and 1 broad in the Middle, drawing to a Point at each End; they are slightly sawed on their Edges, and are downy on their under Side sitting close to the Stalk; the upper Part of the Stalk divides into Foot Stalks, which sustain purple Flowers in scaly Empalements. These appear the latter End of *July*, but are seldom succeeded by good Seeds in *England*.

The 3d Sort is a Native of *North America*; the Root is perennial; the Stalks rise 6 or 7 Feet high, they are purple and channelled. The Leaves are oblong, oval, about 3 Inches long and an Inch and a Half broad in the Middle ending in acute Points; they are stiff, sawed on their Edges, and of a light green on both Sides. The Flowers grow in a loose Corymbus at the Top of the Stalk, they are purple, and have roundish Empalements. This Sort flowers in *August*, but the Seeds seldom ripen in *England*.

The 4th Sort grows naturally in *Carolina*, from whence I received the Seeds. This hath a tuberous Root, from which comes out a single Stalk near 3 Feet high, garnished with stiff linear Leaves about 3 Inches long, which are entire, and rough to the Touch, of a pale green on both Sides. The upper Part of the Stalk is adorned with purple Flowers, having oblong rough prickly Empalements; these come out from the Side of the Stalk alternately, and the Stalk is terminated by one Head larger than the other; these sit close to the Stalks. The Flowers appear in *August*, but this Sort never ripens Seeds here.

The 5th Sort grows naturally in most Parts of *North America*; this has a large tuberous Root from which comes out one strong channelled Stalk, 3 or 4 Feet high, closely garnished with narrow Spear-shaped Leaves which are entire; they are about 3 Inches long, and half an Inch broad. The upper Part of the Stalk is adorned with a long loose Spike of purple Flowers, which come out from the Side upon pretty long blunt Foot Stalks; they have large rough Empalements, composed of Wedge shaped Scales. The Flowers on the Top of the Spike blow first, and are succeeded by the other downward, which is contrary to the greatest Number of Plants, whose Flowers are ranged in Spikes, for most of them begin to flower at the Bottom and are succeeded by those above. The Flowers of this Sort appear in *August*, but the Seeds do not ripen here.

The 6th Sort is a Native of *North America*; this has a tuberous Root, from which comes forth a single Stalk, that rises from 2 to 3 Feet high, garnished with very narrow smooth Leaves, which at Bottom are more than 3 Inches long, but gradually diminish to the Top; they are placed round the Stalk without any Order, sitting close to it at their Base. The upper Part of the Stalk is adorned with smaller purple Flowers than those of the former, sitting very close to the Stalk, forming a long loose Spike; they appear about the same Time as those of the former Sort.

The 7th Sort is also a Native of *North America*; this has a perennial fibrous Root, from which arise several strong purple Stalks upward of 6 Feet high, they are channelled and garnished with Spear-shaped Leaves, which toward the Bottom of the Stalks are more than 6 Inches long, and an Inch and a Half broad in the Middle, drawing to Points at both Ends; they are gradually less to the Top of the Stalks and are stiff, deeply sawed on their Edges, of a pale green on their under Side. The upper Part of the Stalk divides into small Branches, forming a loose Corymbus of purple Flowers, which are irregular in Height, some of the Flowers standing on shorter Foot Stalks than the other; their Empalements are round, and the Scales terminate in bristly Points. This Sort flowers in *July* and *August*, but does not produce good Seeds in *England*.

The 8th Sort grows naturally in *Carolina*; this has a fibrous perennial Root; the Stalk is branching, and rises 4 Feet high; the Leaves are 7 Inches long, and an Inch and a Half broad in the Middle, ending in acute Points; they are entire and hairy on their under Side, sitting close to the Stalk. The Flowers grow in loose Bunches at the End of the Branches, they have oval Empalements, composed of a few Scales which terminate in Bristles. The Flowers are of a pale purple Colour, and appear late in Summer, so are not succeeded by Seeds here.

The 9th Sort grows naturally in the northern Parts of *China*, from whence the Seeds were brought to *England*. This rises with an herbaceous round Stalk, a Foot and a Half high, covered lightly with a white Meal; it branches out on every Side, almost the whole Length; the Branches spread out almost horizontally, they are garnished with smooth, oblong, oval Leaves, with a few blunt Indentures on their Edges. The lower Leaves are about 4 Inches long, and 2 and a Quarter broad in the Middle; they are of a light green Colour, and have a white Mid-rib. The Flowers are produced in loose Bunches at the Extremity of the Branches, have roundish soft Empalements, whose Scales end with hairy Points, and are composed of a great Number of hermaphrodite Florets of a bluish purple Colour, that are equal. This Sort flowers in *July*, and the Seeds ripen in Autumn, and then the Plants decay.

The 10th Sort grows naturally on the Tops of Mountains in *Wales* and the North of *England*, and is but seldom kept in Gardens. The Root is perennial, from which come out 1, 2, or 3 Stalks, which rise a Foot and a Half high; they are of a deep green Colour and are channelled, garnished with deep green Leaves their whole Length; those at the Bottom are indented, but those on the upper Part of the Stalks are entire; they are about

about 3 Inches long, and almost 1 broad, of a dark-green Colour. From the Middle of the Stalk upward, there are Branches sent out from the Side, which grow erect, and sustain at the Top small Bunches of purple Flowers, which have oblong slender Empalements a little hairy. The Flowers appear in June and July.

The 11th Sort grows naturally in the South of France and Italy; this is an annual Plant, the Stalks rise 2 Feet high, and branch out on every Side; the lower Leaves are 7 Inches long, their Mid-ribs have leafy Borders running from one Lobe to the other; the inner Lobes are very small, but those on the Outside of the Leaves are 2 Inches long, and a Third of an Inch broad, ending with obtuse Points; they are slightly sawed on their Edges, and are of a light green. The Leaves on the upper Part of the Stalks are very narrow, they are winged and sawed on their Edges, and are of a lighter Colour than those at Bottom. The Flowers are produced at the End of the Branches, in oblong oval Heads or Empalements, whose Scales are Awl-shaped and end in acute Points; the Flowers are purple, and are made up of several Florets in the same Manner as the other Species. It flowers most of the Summer Months, and the Seeds ripen in Autumn, which, if permitted to scatter, there will plenty of the Plants come up without Care, and these autumnal Plants will flower early the following Summer.

The 12th Sort is very like the 11th, and has been often confounded with it. This grows naturally in Sicily, and is generally believed to be that Species described by *Pabius Columna*, under the Title of *Seneciocordus Apulus Ecphr.* i. p. 32 though the former has by many been supposed to be that. The Stalks of this Sort do not branch so much as those of the former, the Leaves are composed of many more Lobes, which are narrower and deeper sawed; the Serratures are regular, and have the Appearance of Lobes of winged Leaves, but are very acute; the Leaves are hoary, and the Stalks are of a pale green, dividing toward the Top into 4 or 5 naked Foot Stalks, each sustaining 1 purple Flower like those of the former Sort. It flowers about the same Time, and the Seeds ripen about a Month after, which are more compressed at their Base, than those of the other Sort.

The 8 Sorts first mentioned, are hardy perennial Plants, so will thrive in the open Air in England. The first is rarely admitted into Gardens, but the other Sorts are frequently preserved by the Curious. The 4th, 5th, and 6th Sorts, have large knobbed Roots; these are propagated only by Seeds, which seldom ripen in England, so must be procured from Abroad. These should be sown on an East aspected Border, where the Morning Sun only comes, for if the Seeds are exposed to the Mid-day Sun, they seldom succeed well. These Seeds will often grow the first Summer, if they are sown early in the Spring, but sometimes they will remain in the Ground a Year, before the Plants appear; so that if they should not come up the first Season, the Ground should not be disturbed, and must be kept clean from Weeds till the following Spring, when, if the Seeds were good, the Plants will come up; when these appear, they must be kept clean from Weeds; and if they are too close, some of the Plants should be carefully drawn out while they

are young, and planted in another Border of light loamy Earth, 4 Inches asunder; in this Place they may remain till Autumn, when these, and also those in the Seed Beds, should be carefully removed to the Places where they are to remain; the following Summer these Plants will flower, and the Roots will abide several Years, if they are planted in a light loamy Soil not over wet.

The other perennial Sorts may be propagated by parting the Roots; the best Time for doing this is in Autumn when their Stalks begin to decay; for when they are removed in the Spring, if the Season should prove dry, their Roots will not be sufficiently established to flower well the same Year. These Plants should not be removed or parted oftener than every third Year, if they are expected to grow strong; nor should they be parted into small Heads, for those will make no Figure the first Year. As these Plants grow tall, so they should be planted in the Middle of large Borders, or with other tall Plants; they may be planted in Spaces between Shrubs, or on the Borders of Wood, where they will have a good Effect, during their Continuance in flower; and as they require no other Culture than to dig the Ground between them every Spring, and keep them clean from Weeds, they are proper Furniture for such Places.

These Sorts are also propagated by Seeds, when they can be obtained good; these may be sown as the bulbous rooted Kinds, and when the Plants come up, they may be treated in the same Manner, only that these should be allowed more Room, for the Fibres of the Roots spread out on every Side to a great Distance, for which Reason these Plants should not be planted in small Gardens, where they will overbear the neighbouring Plants.

The 10th Sort is a perennial Plant, which may be propagated by its creeping Roots; this may be planted in a shady Border of loamy Earth, where it will thrive and annually produce Flowers.

The 9th Sort is an annual Plant; the Seeds should be sown on a moderate hot Bed the Beginning of April, and when the Plants come up and are fit to remove, they should be transplanted to a fresh hot Bed to bring them forward, observing to shade them from the Sun till they have taken new Root; then they may be treated as Amaranths, and other tender annual Plants, keeping them in the hot Bed till June, when they should be gradually hardened to the open Air, and part of the Plants may be taken up with Balls of Earth to their Roots, and planted in warm Borders, where they will flower, and if the Season proves warm, they will ripen their Seeds; but it will be proper to have some Plants in Pots which should be placed in an airy Glass Case, in order to get good Seeds, lest those in the open Air should fail.

The two last annual Sorts are hardy Plants; if the Seeds of these are sown the Beginning of April, in the Places where they are designed to stand, the Plants will come up in a Month or five Weeks after, and will require no other Care but to thin them where they are too close and keep them clean from Weeds; or if, as was before-mentioned, the Seeds are permitted to scatter in the Autumn, the Plants will come up without Care.

The Flowers of these Plants are small, so make no
H h h 2 great

great Appearance; but the Seeds are closely furnished on their Crowns with fine soft Hairs, which expand at the Top, and appear like the Hairs of a Painters Pencil spread open; so that when the Seeds fall on the Ground, they are moved about by the least Motion of the Air; and when they are laid upon Paper, it is difficult to close them up; for by moving the Paper, the Seeds are apt to creep out, by their Hairs moving each other, from whence the Dutch have titled the Seeds *Creepers*.

SESAMUM Lin. Gen. Pl. 700. *Digitalis*. Tourn. Inst. R. H. 165. Oilly Grain.

The Characters are,

The Flower has an erect permanent Empalement of 1 Leaf cut at the Top into 5 very short equal Parts. The Flower has 1 ringent Petal, with a roundish Tube the Length of the Empalement; the Chaps are swollen, Bell-shaped, and spreading; the Brim is cut into 5 Points, 4 which are spreading and almost equal; the other is twice their Length, oval, and erect. It has 4 Stamina rising from the Tube which are shorter than the Petal, the 2 inner being shorter than the other, terminated by erect pointed Summits; and an oval hairy Germen, supporting a slender Style longer than the Stamina, crowned by a Spear-shaped Stigma divided in two Parts. The Germen becomes an oblong, almost four-cornered Capsule, compressed and acute pointed, having 4 Cells, filled with oval compressed Seeds.

The Species are,

1. SESAMUM foliis ovato-oblongis integris. Hort. Cliff. 318. *Sesamum* with oblong oval entire Leaves. *Digitalis Orientalis*, *sesamum dicta*. Tourn. Inst. 165. Eastern Foxglove, called *Sesamum*.

2. SESAMUM foliis inferioribus trifidis. Prod. Leyd. 392. *Sesamum* with trifid lower Leaves. *Sesamum alterum*, foliis trifidis. *Oriente semine obscuro*. Pluk. Alm. 344. Another Eastern *Sesamum*, with trifid Leaves and black Seeds.

3. SESAMUM foliis omnibus trifidis. *Sesamum* with all the Leaves trifid. *Sesamum Orientale*, trifidum, flore nivo. Hort. Compt. Eastern *Sesamum*, with a trifid Leaf and snow white Flower.

The 1st Sort is cultivated in great Plenty in the Levant, but is supposed to have been brought there from India. It is an annual Plant rising with an herbaceous four-cornered Stalk about 2 Feet high, sending out a few short Side Branches; the Leaves are oblong, oval, a little hairy, and stand opposite. The Flowers are produced in loose Spikes at the Top of the Stalks, they are small, and of a dirty white Colour, shaped somewhat like those of the Foxglove. These appear in July, and after the Flowers are past, the Germen turns to an oval, acute-pointed Capsule with 4 Cells, filled with oval compressed Seeds which ripen in Autumn.

The 2d Sort grows naturally in India; this is also an annual Plant, the Stalk rises taller than that of the former, the lower Leaves are cut into 3 Parts, which are the only Differences between them.

The 3d Sort grows naturally in Africa; this is also an annual Plant, with a taller and more branched Stalk than either of the former, and all the Leaves are cut into 3 Parts, in which it differs from both the other.

I have raised two other Species of this Genus, from

Seeds which were brought from Africa, but these being sown late in the Spring, did but just shew their Flowers before Winter, so there could be no good Seeds obtained from them. These grew near 4 Feet high, the Leaves of one Sort were much longer than any of the other, and those toward the Top of the Stalk were divided into 3 and some into 4 Parts; the Seeds of this were black, the other had broader Leaves, sawed on their Edges. The Flowers were large of a pale blue Colour, and the Seeds were a pale yellow.

The 1st Sort is frequently cultivated in all the Eastern Countries, and in Africa, as a Pulse; and of late Years the Seeds have been introduced in Carolina by the African Negroes, where they succeed extremely well. The Inhabitants of that Country make an Oil from the Seed, which will keep many Years, and not take any rancid Smell or Taste, but in two Years becomes quite mild; so that when the warm Taste of the Seed, which is in the Oil when first drawn, is worn off, they use it as a Sallad Oil, and for all the Purposes of sweet Oil.

The Seeds of this Plant are also used by the Negroes for Food, which Seeds they parch over the Fire, and then mix them with Water, and stew other Ingredients with them, which makes an hearty Food. Sometimes a Sort of Pudding is made of these Seeds, as with Millet or Rice, and is by some Persons esteemed, but is never used for these Purposes in Europe. This is called Benney, or Bonny in Carolina.

In England, these Plants are preserved in Botanic Gardens as Curiosities. Their Seeds must be sown in the Spring upon a hot Bed, and when the Plants are come up, they must be transplanted into a fresh hot Bed, to bring them forward. After they have acquired a tolerable Degree of Strength, they should be planted into Pots filled with rich light sandy Soil, and plunged into another hot Bed, managing them as hath been directed for *Amaranthus*, to which I shall refer the Reader, to avoid Repetition: For if these Plants are not thus brought forward in the former Part of the Summer, they will not produce good Seeds in this Country; though after they have flowered, if the Season is favourable, they may be exposed in a warm Situation with other annual Plants. When these Plants have perfected their Seeds they decay, and never continue longer than one Season.

The Seed of the first Sort is mentioned in the List of Official Simples in the College Dispensatory, but is rarely used in Medicine in England. From nine Pounds of this Seed which came from Carolina, there were upwards of two Quarts of Oil produced, which is as great a Quantity as hath been known to be drawn from any Vegetable whatever; and this, I suppose, might occasion its being called Oilly Grain.

SESELI. Boerh. Ind. alt. 1. p. 50. Lin. Gen. Pl. 322. Wild Spignel.

The Characters are,

It has an umbellated Flower; the Figure of the greater Umbel is uncertain, the particular Umbels are very short multiplex, and almost globular. The principal Umbel has no Involucrum, the particular ones have a many narrow leaved Involucrum, as long as the Umbel; the Empalement of the Flowers is scarce discernible; the principal Umbel is uniform. The Flowers have 5 inflexed Heart-shaped Petals

Petals, a little unequal; they have each 5 Awl-shaped Stamina, terminated by single Summits. The Germen is situated under the Flower, supporting 2 reflexed Styles, crowned by obtuse Stigmas. The Germen turns to a small, oval, channelled Fruit, dividing in 2 Parts, each containing 1 oval streaked Seed, flat on one Side and convex on the other.

The Species are,

1. *SESELI petiolis ramiferis membranaceis ventricosis emarginatis. Hort. Cliff. 103. Seseli with bellied membranaceous branching Foot Stalks, indented at the Top. Fœniculum sylvestre annuum, tragoselinii odore, umbella alba. Bot. Paris. 54. Annual wild Fennel swelling like Burnet Saxifrage, and a white Umbel.*

2. *SESELI foliis bipinnatis sublinearibus, petiolis basi membranaceis, seminibus ovalibus. Lin. Sp. Pl. 360. Seseli with double-winged Leaves almost linear, with a membranaceous Base to the Foot Stalks, and oval Seeds. Caruifolia. C. B. P. 158. Caraway Leaf.*

3. *SESELI petiolis ramiferis membranaceis oblongis integris, foliis singularibus binatisque. Guett. 64. Seseli with branching, oblong, entire, membranaceous Foot Stalks, and the small Leaves single and by Pairs. Fœniculum sylvestre glauco folio. Tourn. Inst. 311. Wild Fennel with a gray Leaf.*

4. *SESELI petiolis ramiferis membranaceis oblongis integris, foliis caulinis angustissimis. Hort. Cliff. 102. Seseli with oblong, entire, membranaceous, branching Foot Stalks, and very narrow Leaves on the Stalks. Fœniculum sylvestre perenne, serua folio brevior. Tourn. Inst. 311. Wild perennial Fennel with a shorter Giant's Fennel Leaf.*

5. *SESELI caule alto rigido, foliis linearibus fasciculatis. Lin. Sp. Pl. 260. Seseli with a tall stiff Stalk, and very narrow Leaves in Clusters. Fœniculum tortuosum. J. B. 3. p. 16. Crooked or contorted Fennel.*

6. *SESELI petiolis membrana destitutis. Flor. Leyd. Prod. 112. Seseli with Foot Stalks without Membranes. Fœniculum Lusitanicum minimum acre. Tourn. Inst. 312. The least acrid Portugal Fennel.*

The 1st Sort grows naturally in France among the Corn; this rises with an erect Stalk, near 2 Feet high, sending out Branches from the Side, and is garnished with short Leaves divided into small Segments or Leaves like Hogs Fennel. At the Foot Stalk of each Branch or Leaf is a bellied Membrane, which embraces it. The Stalk is terminated by an Umbel of white Flowers which appear in June, and the Seeds ripen the Beginning of August.

The 2d Sort grows naturally in Germany; this hath a perennial Root. The Leaves are long, and made up of 8 or 9 Pair of winged Lobes cut like those of Parsley; the Stalk rises near 2 Feet and a Half high, branching out into several Divisions; at each of these there is a Membrane embracing the Base, and 1 small Leaf composed of a few linear Lobes. The Stalks are terminated by compound Umbels of yellow Flowers, which appear in June, and are succeeded by Seeds which ripen in August.

The 3d Sort grows naturally in uncultivated Places in the South of France and Italy; this has a perennial Root which runs deep in the Ground, sending out slender smooth Stalks near 2 Feet high. The Leaves are long and narrow, composed of 7 or 8 Pair of Wings, whose

Lobes are sometimes single, and others are divided into two Parts; they have a Membrane embracing their Foot Stalks; they are of a gray Colour. The Stalks are terminated by Umbels of Flowers, purple on their Outside and white within; these appear in July and August, and the Seeds ripen in Autumn.

The 4th Sort grows naturally on the dry Hills in many Parts of France and Italy; this has a perennial Root, from which come out Leaves like those of Spignel, but the Segments are broader and of a gray Colour. The Stalks rise a Foot high, and are garnished with a few very narrow Leaves, whose Foot Stalks are embraced by a long entire Membrane; they launch out on every Side, and these are terminated by Umbels of white Flowers which appear in July, and are succeeded by Seeds which ripen in Autumn.

The 5th Sort grows naturally in the South of France, Italy, and Spain; this has a thick ligneous Root, from which come out stiff Stalks, near 4 Feet high, crooked at their Joints, and garnished with narrow Leaves coming out in Bunches. The Stalks divide into slender Branches, which have small Umbels of Flowers coming out of their Sides, and are terminated by larger. The Flowers are small, yellow, appear in July, and are succeeded by Seeds which ripen in Autumn.

The 6th Sort is an annual Plant and grows naturally in Portugal. The Leaves of this Sort are like those of Spignel, but are much smaller, and have a very acrid biting Taste. The Stalks rise 4 Inches high, and sustain a small Umbel of Flowers which appear in July, and, if the Season is warm, the Seeds will ripen in Autumn.

These Plants are preserved in the Gardens of Botanists for Variety, but at present their Virtues are unknown, and, as they have little Beauty to recommend them, they are rarely admitted into other Gardens.

These may be propagated by sowing their Seeds, which is best done in Autumn, for when the Seeds are sown in the Spring, they frequently lie in the Ground till the next Year, before the Plants will appear, whereas those, which are sown in Autumn, always rise the following Spring. These Seeds should be sown in Drills, about eighteen Inches asunder, in a Bed of fresh Earth, where they are designed to remain, and in the Spring, when the Plants come up, they should be thinned where they are too close, leaving them about six Inches Distance in the Rows; after this the Plants will require no farther Care, but to keep them constantly clear from Weeds, and the second Season they will produce Seeds. The perennial Sorts, which are permitted to remain after they have seeded, should have the Ground Gently dug every Spring between the Rows to loosen the Earth, but there should be Care taken not to injure their Roots with the Spade. These Plants love a moist Soil, for when they are sown on dry Ground, they do not thrive near so well, and seldom perfect their Seeds, unless the Season proves moist, or they are duly watered.

SHERARDIA. Dillen. Gen. Nov. 3. Lin. Gen. Pl. 112. Aparine. Tourn. Inst. R. H. 114. Little Field Madder.

The Characters are,

The Flower has a small four-pointed permanent Empalement sitting upon the Germen; it has 1 long tubulous Petal.

Petal cut into 4 plain acute Parts at the Brim; it has 4 Stamina, situated on the Top of the Tube, terminated by single Summits, and an oblong twin Germen below the Flower supporting a slender bifid Style crowned by 2 beaded Stigmas. The Germen becomes an oblong crowned Fruit containing two oblong Seeds which are separated.

The Species are,

1. *SHERARDIA foliis omnibus verticillatis, floribus terminalibus* Lin. Sp. Pl. 102. *Sherardia* with all the Leaves placed in Whorls, and Flowers terminating them. *Asparine supina, pumila, flore ceruleo.* Tourn. Inst. 114. Low lupine Clivers with a blue Flower.

2. *SHERARDIA foliis floralibus binis oppositis binis floribus.* Lin. Sp. Pl. 103. *Sherardia* with Leaves among the Flowers by Pairs opposite, and 2 Flowers at a Place. *Asperula verticillata muralis minima.* Col. Ecpbr. 302. The least Wall whorled Woodroof.

The 1st Sort grows naturally among the Corn in many Parts of England; it is an annual Plant, with trailing Stalks which spread on the Ground, are sometimes a Foot long, and garnished with short acute-pointed Leaves growing in Whorls, some of which have 4, others 5 and 6, and some have 8 Leaves in each Whorl. From the Side of the Stalks come out the Foot Stalks of the Flowers, which sustain one Whorl of Leaves, upon which the Flowers sit very close; there are generally 5 or 6 Flowers upon each Whorl; they are blue, and have pretty long Tubes, cut into 4 Segments at the Top spreading open. (These Flowers appear in June, and their Seeds ripen in Autumn.

The 2d Sort is an annual Plant, which grows naturally on Walls and dry Places in Italy. The Stalks are short; the Leaves grow by Pairs; the Flowers are yellow, and come by Pairs. These Plants are seldom admitted into Gardens, for their Seeds scatter, and come up without Care.

SHERARDIA. Vaill. See Verbena.

SICYOS. Lin. Gen. Pl. 971. *Sicyoides.* Tourn. Inst. 103. Single seeded Cucumber.

The Characters are,

It hath male and female Flowers on the same Plant; the male Flowers have a Bell-shaped Empalement of 1 Leaf with 5 Indentures. The Petal is Bell-shaped of 1 Leaf growing on the Empalement; they have each 3 Stamina united above, terminated by Summits joined in a Head. The female Flowers are like the male, and sit upon the Germen; they have no Stamina, but the Germen supports a cylindrical Style crowned by a thick three-pointed Stigma. The Germen becomes an oval Fruit set with bristly Hairs, having 1 Cell containing a single Seed of the same Shape.

The Species are,

1. *SICYOS foliis angulatis.* Hort. Cliff. 452. *Sicyos* with angular Leaves. *Sicyoides Americana, fructu echinato, foliis angulatis.* Tourn. Inst. 103. American prickly one-seeded Cucumber with angular Leaves.

2. *SICYOS foliis laciniatis.* Lin. Sp. Pl. 1013. *Sicyos* with cut Leaves. *Sicyoides Americana, fructu echinato, foliis laciniatis.* Plum. Cat. 3. American prickly one-seeded Cucumber with cut Leaves.

3. *SICYOS foliis ternatis incis.* Flor. Leyd. Prod. 265. *Sicyos* with trifoliate cut Leaves. *Bryonia alba tryphilla geniculata, foliis crassis acidis.* Sloan. Cat. 106. Three-leaved, jointed, white Bryony, with thick acid Leaves.

The 1st Sort grows naturally in North America; this is an annual Plant, which rises with two large Seed Leaves like those of the Cucumber. The Stalk is trailing, and has Tendrils, by which it fastens itself to the neighbouring Plants, and will rise 15 or 16 Feet high, dividing into many Branches garnished with angular Leaves like those of Cucumber. The Flowers come out on long Foot Stalks from the Side of the Branches standing in Clusters; there are male which are barren Flowers, and female fruitful Flowers in the same Plant; they are small of a pale Sulphur Colour, and are succeeded by prickly oval Fruit containing one Seed; the Flowers appear in June and August, and the Seeds ripen in Autumn. If these are permitted to scatter, the Plants will come up in the Spring better than when sown by Hand, and require no other Care, but to keep them clean from Weeds. These Plants ramble and take up too much Room for small Gardens, and therefore should be allowed a Place near a Hedge upon which they may climb; they do not bear transplanting well, unless when the first come up.

The 2d Sort grows naturally in the West-Indies; this is also an annual Plant with trailing Stalks like the former, but the Leaves of this are cut into several Segments. The Flowers are larger than those of the former, and are of a deeper Colour; the Fruit is not quite so large, nor so closely armed with prickly Hairs, in which consists their Difference.

This Sort is not so hardy as the first, therefore whoever has a Mind to cultivate it, must sow the Seeds on a hot Bed in the Spring, and treat the Plants as Cucumbers and Melons, keeping them under Frames, otherwise the Seeds will not ripen in England, but the Plants will require more Room than either of the former, so that 1 or 2 Plants will be enough for Curiosity, as they have no great Beauty or Use.

The 3d Sort grows naturally in Jamaica; this is a perennial Plant, with thick jointed Stalks which are fleshy and succulent, but by Age become ligneous; they send out many Side Branches which have Tendrils or Claspers, by which they fasten themselves to any neighbouring Support, and rise 7 or 8 Feet high; they are garnished with trifoliate Leaves standing on pretty long Foot Stalks, which are thick, succulent, of a gray Colour, and cut on their Edges, having a sharp acid Taste. The Flowers come out in Clusters from the Side of the Branches, like those of the Vine; they are small, and of an herbaceous Colour. This Plant has flowered in the Chelsea Garden, but has not produced Fruit in England.

It is propagated by Seeds, which should be sown in small Pots, and plunged into a hot Bed of Tanners Bark, where the Pots should remain till the Plants come up, for the Seeds sometimes lie long in the Ground. When the Plants are fit to remove they should be each planted into a small Pot filled with light Earth, and plunged into a new hot Bed shading them from the Sun till they have taken new Root; after which they must be treated as other tender Plants from the same Country, keeping them always in the Tan Bed in the Stove, and in Winter they should have but little Water. This Plant is preserved for Variety in the Gardens of the Curious.

SIDA.

SIDA. Lin. Gen. Pl. 747. *Malvinda*. Dillen. Hort. Eltb. 171, 172. Indian Mallow.

The Characters are,

The Empalement of the Flower is single, permanent, angular, and five-pointed. The Flower is of 1 Petal cut into 5 broad Segments joined at their Base, and indented at their Points; it has many Stamina joined in a Column at Bottom, which spread open above, and are terminated by roundish Summits, and an orbicular Germen supporting a short multifid Style crowned by beaded Stigmas. The Germen becomes a five-cornered Capsule having 5 Cells, each containing an angular roundish Seed.

The Species are,

1. SIDA foliis ovato-lanceolatis serratis, floribus solitariis axillaribus, semine rostrato bidente. Indian Mallow with oval, Spear-shaped, sawed Leaves, single Flowers on the Side of the Stalk, and Seeds with two Horns. *Malvinda ulmifolia* semine rostrato bidente. Aët. Phil. Lond. 399. Indian Mallow with an Elm Leaf, and Seeds with two Horns or Teeth.

2. SIDA caule ramoso hirsuto, foliis lanceolatis serratis floribus confertis axillaribus, semine rostrato simplici. Sida with a branching hairy Stalk, Spear-shaped sawed Leaves, Flowers in Clusters from the Wings of the Stalk, and Seeds with a single Horn or Tooth. *Malva erecta minor*, *carpini folio*, seminibus singulis simplici aculeo longiore donatis. Sloan. Cat. Smaller upright Mallow with a Horn-beam Leaf, and the Seeds have a single longer Horn.

3. SIDA caule erecto ramoso, foliis lineari-lanceolatis dentatis subtus villosis, pedunculis axillaribus unifloris. Sida with an erect branching Stalk, linear Spear-shaped Leaves hairy on their under Side, and Foot Stalks with one Flower at the Wings of the Stalks. *Malvinda pimpinella folio angustiore* semine bidente. Aët. Phil. Lond. Vol. 35. Indian Mallow with a narrow Burnet Leaf, and Seeds with two Horns.

4. SIDA foliis cordatis serratis, pedunculis unifloris axillaribus, semine rostrato bidente. Sida with Heart-shaped sawed Leaves, Foot Stalks with one Flower from the Wings of the Stalk, and Seeds with two Horns. *Malvinda pimpinella majoris folio*, semine bidente. Aët. Phil. Lond. 399. Indian Mallow with a greater Burnet Leaf, and Seeds with two Teeth.

5. SIDA foliis ovato-lanceolatis serratis, floribus axillaribus sessilibus, semine tridente. Sida with oval Spear-shaped Leaves which are sawed, Flowers sitting close at the Wings of the Stalks, and Seeds with three Teeth. *Malvinda profundius serrato folio*, semine tridente. Aët. Phil. Lond. 399. Indian Mallow with Leaves deeply sawed, and Seeds with three Teeth.

6. SIDA caule erecto hirsuto, foliis subcordatis sessilibus serratis subvillosis, floribus confertis axillaribus sessilibus. Sida with a hairy Stalk, Leaves almost Heart-shaped sitting close to the Stalk, a little woolly, and Flowers in Clusters sitting close at the Wings of the Stalk. *Malvinda carpini folio villosa*, floribus conglobatis ad foliorum alas. Houst. Mss. Indian Mallow with a Horn-beam Leaf, and clustered Flowers at the Wings of the Leaves.

7. SIDA foliis orbiculatis plicatis serratis. Hort. Cliff. 346. Sida with orbicular plaited Leaves which are saw-

ed. *Malvinda stellata alnifolia*. Hort. Eltb. 172. Starry Indian Mallow with an Alder Leaf.

8. SIDA foliis cordatis subangulatis serratis villosis. Lin. Sp. Pl. 684. Sida with Heart-shaped Leaves almost angular, woolly and sawed. *Malvinda bicornis*, bulletes folio molli. Hort. Eltb. 211. Indian Mallow with two Horns, and a soft black Horehound Leaf.

9. SIDA foliis orbiculato cordatis crenatis, caule petiolisque hirsutis, pedunculis longis axillaribus unifloris. Sida with orbicular, Heart-shaped, crenated Leaves, the Stalks and Foot Stalks of the Leaves hairy, and long Foot Stalks from the Wings of the Stalk with one Flower.

10. SIDA capitulis pedunculatis triphyllis septemfloris. Lin. Aët. Upsal. 1743. p. 137. Sida with Heads on Foot Stalks which have 3 Leaves and 7 Flowers. *Malva aspera major aquatica*, ex bortenium seu rosarum genere, flore minore luteo, semine aculeato. Sloan. Cat. Jam. 96. Greater aquatick rough Mallow of the Garden, or Rose Mallow Kind with small yellow Flowers, and prickly Seeds.

11. SIDA foliis lanceolatis serratis villosis, caule erecto piloso, pedunculis axillaribus unifloris. Sida with Spear-shaped, woolly, sawed Leaves, an erect hairy Stalk, and Foot Stalks from the Wings of the Stalk with one Flower. *Malvinda hirsutissima carpini folio longiore* floribus singulis ad foliorum alas, semine bidente. Houst. Mss. Indian Mallow very hairy, with a longer Horn-beam Leaf, and single Flowers at the Wings of the Leaves, and Seeds with 2 Teeth.

12. SIDA foliis cordatis crenatis acuminatis villosis, caule petiolisque pilosis, pedunculis axillaribus unifloris. Sida with Heart-shaped, pointed, crenated, woolly Leaves, the Stalks and Foot Stalks hairy, and Foot Stalks with one Flower at the Wings of the Stalk. *Malvinda abutili folio minore*, caulibus hirsutissimis, floribus ad foliorum alas. Houst. Mss. Indian Mallow with a smaller yellow Mallow Leaf, very hairy Stalks, and Flowers proceeding from the Wings of the Leaves.

13. SIDA caulibus procumbentibus, foliis oblongo-ovatis serratis hirsutis, floribus sessilibus terminalibus. Sida with trailing Stalks, oblong, oval, hairy, sawed Leaves, and Flowers sitting close at the End of the Branches. *Malva minor supina*, *betonica folio*, flore coccineo seminibus asperis. Sloan. Cat. Jam. 97. Smaller supine Mallow with a Betony Leaf, a scarlet Flower, and rough Seeds.

14. SIDA foliis cordatis serratis acuminatis glabris, caule ramoso, pedunculis axillaribus unifloris. Sida with Heart-shaped, sawed, acute-pointed, smooth Leaves, a branching Stalk, and Foot Stalks from the Wings of the Stalks with one Flower. *Malvinda abutili folio acuminato*, floribus parvis luteis, ex alis foliorum, semine bidente. Houst. Mss. Indian Mallow with a pointed yellow Mallow Leaf, and small yellow Flowers at the Wings of the Leaves, and Seeds with 2 Teeth.

15. SIDA caulibus procumbentibus, foliis ovatis serratis tomentosis nitidis, floribus solitariis axillaribus sessilibus. Sida with trailing Stalks, oval, sawed, neat, woolly Leaves, and single Flowers sitting close to the Wings of the Stalk. *Malvinda supina*, foliis subrotundis sericeis, seminibus non dentatis. Houst. Mss. Supine Indian Mallow with roundish Satten Leaves, and the Seeds without Teeth.

16. SIDA

16. *SIDA foliis subcordatis crenatis subtus tomentosis; floribus aggregatis axillaribus sessilibus.* Sida with almost Heart-shaped Leaves, crenated and woolly on their under Side, and Flowers in Clusters sitting close at the Wings of the Stalk. *Malva Americana abutili folio, floribus congestatis ad foliorum alas.* Houst. Mss. Indian Mallow with a yellow Mallow Leaf, and Flowers in Clusters at the Wings of the Leaves.

17. *SIDA foliis subovatis serratis nervosis subtus tomentosis, caule piloso, pedunculis axillaribus multifloris.* Sida with veined sawed Leaves almost oval, woolly on their under Side, a hairy Stalk, and Foot Stalks with many Flowers at the Wings of the Stalks. *Malvinda carpinifolia, flore luteo caule & aversa foliorum parte villosa.* Houst. Mss. Indian Mallow with a Horn-beam Leaf, and a yellow Flower whose Stalk and the under Part of the Leaf are hairy.

18. *SIDA foliis lanceolatis inaequaliter serratis acuminatis, floribus capitatis terminalibus, caule fruticoso.* Sida with Spear-shaped acute-pointed Leaves unequally sawed, Flowers collected in Heads at the End of the Branches, and a shrubby Stalk. *Malvinda frutescens ulnifolia, seminibus singulis tribus aculeis lapaceis armatis.* Houst. Mss. Indian Mallow with an Elm Leaf, and single Seeds armed with three burry Prickles.

19. *SIDA foliis cordatis acuminatis serratis nervosis, floribus aggregatis axillaribus sessilibus.* Sida with acute-pointed, Heart-shaped, sawed, veined Leaves, and Flowers in Clusters sitting close to the Wings of the Stalk. *Malvinda foliis subrotundis acuminatis, floribus albis conglomeratis ad foliorum alas.* Houst. Mss. Indian Mallow with roundish acute-pointed Leaves, and white Flowers in Clusters at the Wings of the Leaves.

20. *SIDA caule erecto suffruticoso, foliis cordatis crenatis tomentosis, pedunculis axillaribus unifloris.* Sida with an erect Under-shrub Stalk, Heart-shaped, woolly crenated Leaves, and Foot Stalks with one Flower from the Wings of the Stalk. *Althea flore luteo.* Sloan. Cat. 96. Marsh Mallow with a yellow Flower.

These Plants grow naturally in the *West Indies*, from whence I have received the Seeds of 3 or 4 Species by the Title of Broom Weed, and I have been informed that the Inhabitants cut these Plants in the same Manner as we do Heath, and make it up into Brooms for sweeping. Sometimes I have received the Seeds by the Title of *West-India Thea*, so that I suppose the Leaves of these Plants are sometimes used as the *Thea*. There are certainly more Species of this Genus than are here mentioned, which have escaped the Notice of those who have been in the *West-Indies* in Search for Plants, for we frequently have new Sorts come up in the Earth which is brought from thence with other Plants. Those here enumerated are undoubtedly distinct Species, for I have cultivated them several Years, and have never observed either of them change, when raised from Seeds.

The 1st Sort grows as far North as *Virginia*, from whence I have several Times received the Seeds; this grows with an upright branching Stalk 3 Feet high, garnished with oval Spear-shaped Leaves, about 2 Inches long, and 1 broad, sawed on their Edges, and sit close to the Branches. The Flowers come out singly from the Wings of the Stalks, standing on very short Foot

Stalks; they have a single Empalement cut into 5 obtuse Segments; they are small, of a pale Copper Colour, and of 1 Petal which is cut into 5 Parts almost to the Bottom, where they are joined. In the Center arises a small Column composed of the several Stamina and Style which are connected together at Bottom, but are separated above. When the Flowers decay, the Germen turns to a Capsule with 5 Cells inclosed by the Empalement; in each Cell is contained 1 angular Seed, gibbous on one Side, having 2 Horns or Teeth at the Point. This Plant flowers till the Frost stops it, and the Seeds ripen in Autumn.

The 2d has hairy branching Stalks which rise near 3 Feet high. The Branches of this come out from the Bottom almost to the Top, and form a pyramidal Bush; the Leaves are longer and narrower; the Saw on the Edges deeper, of a brighter green than those of the former, and stand on short Foot Stalks; the Flowers come out at the Foot Stalks of every Leaf; they are single toward the Bottom of the Stalk, but upward they are in Clusters; the Empalement of the Flower is in 5 Angles, each being terminated by a bristly Hair; the Flowers are of a pale Sulphur Colour, and the Seeds have but 1 Horn or Tooth. It flowers the same Time with the former.

The 3d Sort rises with a slender ligneous Stalk about 2 Feet high, sending out many erect Branches garnished with narrow Spear-shaped Leaves an Inch and a Half long, and a Third broad in the Middle; they are indented on their Edges, and end in acute Points, having pretty long slender Foot Stalks. The Flowers come out singly from the Wings of the Stalks; they are small, of a pale yellow Colour, and appear at the same Time with the former.

The 4th Sort has very slender Stalks, which seldom rise much more than a Foot high, sending out a few slender Branches, garnished with small Heart shaped Leaves, sawed on their Edges, and a little hoary on their under Side, standing on pretty long Foot Stalks. The Flowers are small, of a pale yellowish Colour, and come out singly from the Wings of the Stalk; these are succeeded by Seeds having 2 Teeth. It flowers the same Time with the former.

The 5th Sort has a hairy Stalk covered with a dark brown Bark, and rises 3 Feet high, sending out many Branches from the Side, garnished with oval Spear-shaped Leaves standing on long Foot Stalks; they are more than 2 Inches long, and one and a Quarter broad, ending in an obtuse Point, and deeply sawed on their Edges. The Flowers come out by Pairs at the Foot Stalk of each Leaf, sitting close to the Stalk; they are larger than those of the former Sorts, and of a deeper yellow Colour; the Seeds of this are larger and have 3 Teeth.

The 6th Sort rises with a ligneous hairy Stalk between 3 and 4 Feet high, sending out a few slender Branches toward the Top. The Leaves are a little woolly, and sit close to the Stalk; they are near 2 Inches long, and 1 broad near their Base, being almost Heart-shaped; they are veined, and sawed on their Edges. The Flowers come out in Clusters on the Side of the Branches, to which they sit very close; they have hairy Empalements cut into acute Segments at the Top; they are

are small, of a pale yellow Colour; and appear at the same Time with the former, and the Seeds have 2 Teeth.

The 7th Sort has a slender ligneous Stalk, which rises more than 2 Feet high, sending out several slender Branches garnished with roundish Leaves having long Foot Stalks, and a little hairy on their under Side. The Flowers come out at the Foot Stalks of the Leaves, sometimes singly, and at others there are 2 or 3 upon slender Foot Stalks; they are of a pale Copper Colour, and appear at the same Time with the former.

The 8th Sort rises with an herbaceous Stalk more than 3 Feet high, sending out several erect Branches from the Sides, garnished with Heart-shaped Leaves 2 Inches and a Half long, and 2 broad; they are sawed on their Edges, are of a light green Colour, soft to the Touch, and stand on very long Foot Stalks which are hairy. The Flowers stand on long Foot Stalks which come out from the Wings of the Stalk; they are small, of a Sulphur Colour, and appear at the same Time with the former.

The 9th Sort has very slender stiff Stalks, covered with fine Hairs, and rise a Foot and a Half high, sending out a few Side Branches, garnished with roundish Heart-shaped Leaves, 2 Inches long, and 1 and three Quarters broad at the Base; they are thin, of a light green Colour, crenated on their Edges, and stand on long slender hairy Foot Stalks. The Flowers come out on long Foot Stalks from the Wings of the Stalks singly; their Empalements terminate with 10 stiff acute Points or Hairs; the Flowers are small and white, appearing at the same Time with the former.

The 10th Sort rises with an herbaceous prickly Stalk near 4 Feet high, sending out several Branches, garnished with rough hairy Leaves standing on long Foot Stalks. These are of different Forms, some are divided into 5 obtuse Lobes, others into 3, some are hollowed on the Sides in Shape of a Fiddle; they are indented on their Edges, and are of a pale green Colour. The Flowers are collected in Heads, which stand on very long hairy Foot Stalks, arising from the Wings of the Stalks. Under each Head are placed 3 obtuse small Leaves, upon which rest 7 pale yellow Flowers which are small, and almost hid by their Empalements; these are succeeded by Seeds having acute Spines. This flowers the same Time as the former.

The 11th Sort rises with a ligneous Stalk 3 Feet high, covered with yellowish Hairs very closely garnished with Spear-shaped hairy Leaves sitting close to the Stalks; they are 2 Inches long, and 1 broad in the Middle, sawed on their Edges, and of a pale green on their under Side. The Flowers come out singly from the Wings of the Stalk, standing on short Foot Stalks; they are small, white, and appear about the same Time with the former.

The 12th Sort rises with very slender infirm Stalks 3 Feet high, covered with long white Hairs, and garnished with soft, woolly, Heart-shaped Leaves sitting on long slender hairy Foot Stalks. The Leaves are little more than 1 Inch long, and three Quarters broad at their Base, and are crenated on their Edges. The Flowers stand on long slender Foot Stalks which arise from the Wings of the Stalk, 2 of them generally com-

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ing out at each Leaf; they are of a pale yellow Colour, and appear at the same Time with the former.

The 13th Sort has many trailing Stalks, which divide into slender Branches, covered with a light brown Bark, and garnished with small oblong oval Leaves sawed on their Edges, and hairy on their under Side, standing on short Foot Stalks. The Flowers are produced in small Clusters sitting close at the End of the Branches; they are small, of a bright scarlet Colour, and are succeeded by Seeds having 2 stiff bristly Teeth. This flowers about the same Time as the former.

The 14th Sort hath smooth round Stalks, which rise 3 Feet high, sending out long slender Branches. The Leaves are smooth, Heart-shaped, of a light green Colour, and stand on long Foot Stalks; the lower Leaves are near 13 Inches long, and almost 2 broad at their Base, sawed on their Edges, and ending in acute Points. The Flowers stand on very long Foot Stalks arising from the Wings of the Stalks singly; they are small, and of a whitish yellow Colour, appearing at the same Time with the former.

The 15th Sort sends out several Stalks from the Root, which spread flat on the Ground, sending out several short Side Branches. The Stalks grow 9 or 10 Inches long, and are garnished with oval Satten Leaves sawed on their Edges, and have short Foot Stalks; the Flowers come out singly at the Wings of the Stalks sitting very close thereto; they are small, of a yellow Colour, and appear at the same Time with the former, and are succeeded by Seeds which have no Teeth.

The 16th Sort has a ligneous Stalk with a purplish Bark, and rises 2 Feet high, sending out several Branches from the lower Part. The Leaves are pretty thick, and almost Heart-shaped, ending with obtuse Points; they are crenated on their Edges, and woolly on their under Side; they are an Inch and a Half long and three Quarters broad near their Base, stand on pretty long Foot Stalks, and have many Veins which arise from the Mid-rib, and diverge to the Borders. The Flowers are of a pale yellow Colour, and are gathered in Clusters sitting close at the Wings of the Stalk; their Empalements are hairy, and cut into many acute Segments at the Top. This flowers the same Time with the former, and the Seeds have 2 Teeth at their Points.

The 17th Sort has a ligneous Stalk, which rises 4 Feet high covered over with brown Hairs, sending out a few long slender Branches, the lower Parts of which are garnished with oval Leaves an Inch and a Half long and three Quarters broad; they are slightly sawed on their Edges, have many longitudinal Veins, and are downy on their under Side. The upper Part of the Branches are destitute of Leaves, more than a Foot in Length, and from their Sides come out Foot Stalks 2 Inches long, sustaining several small yellow Flowers in Clusters, having hairy Empalements cut at the Top into several acute Segments. This Sort flowers the same Time with the former.

The 18th Sort was discovered growing naturally at *La Vera Cruz* in *New Spain*; this rises with a strong Shubby Stalk 6 or 7 Feet high, covered with a rough brown Bark, and sends out several ligneous Branches from the Side, which are hairy, and garnished with Spear-shaped Leaves standing on pretty long Foot Stalks;

they are 6 Inches long, and two broad in the Middle, ending in acute Points, and unequally sawed on their Edges, some of the Indentures being large and deep, others small and shallow, and do not extend so far from the Border. The upper Surface of the Leaves are of a dark green, and their under is of a pale or light green Colour. The Flowers are collected in Heads, standing on long naked Foot Stalks, which terminate the Branches; each of these Heads contain 7 or 8 Flowers, whose Petals extend much beyond their Empalements. The Flowers are of a pale Sulphur Colour when they first open, but afterward fade to an almost white; their Empalements are smooth, but are terminated by 5 hairy Points which stand erect. The Flowers being past, the Germen swells to a short roundish Capsule sitting in the Empalement of the Flower, having 5 Cells, each containing 1 angular Seed, having 3 sharp Teeth which are burry, and stick to the Clothes of those who rub against them when ripe.

The 19th Sort was discovered by the late Dr. Houstoun, in *Jamaica*; this rises with a shrubby Stalk 7 or 8 Feet high, sending out several very slender Branches extending to 2 Feet or more in Length, and bending downward at their Ends; they are garnished at each Joint (which are 2 Inches asunder) by 1 large Heart-shaped Leaf standing on a pretty long Foot Stalk; they are above 4 Inches long, and 2 and a Half broad near their Base, sawed on their Edges, and run out to a long sharp Point, having many strong Veins which rise from the Mid-rib, and diverge toward their Borders; they are of a light green on their upper Surface, and pale on their under. The Flowers grow in Clusters at the Wings of the Stalks; those on the lower Part of the Branches are formed in close obtuse Spikes about an Inch in the Length, but on the upper Part of the Branches they are in globular Heads which are placed nearer together, and have no Leaves under them, the Branches being terminated by one of these Heads. The Empalements of the Flowers end with 5 acute hairy Points; the Flowers are small, and when they first open are white, but afterward they fade to a brownish Colour. When these are past, the Germen becomes a roundish Capsule with 5 Cells sitting in the Empalement of the Flower, each Cell having 1 angular Seed with 2 Teeth.

The 20th Sort rises with ligneous Stalks, covered with a soft woolly Bark about 4 Feet high, sending out a few short Branches from their Sides; they are garnished with Heart-shaped Leaves standing on pretty long Foot Stalks; they are about 2 Inches long, and 1 Inch and a Half broad near their Base, very woolly, of a yellowish green Colour, and of a thick Substance, feeling very soft when handled; they are crenated on their Edges, and have many strong Veins. The Flowers stand on short Foot Stalks which arise from the Wings of the Stalk singly; their Empalements are woolly and obtuse; the Flowers are yellow, and are succeeded by Seeds which have 2 Teeth.

These Plants are most of them annual in *England*, but some of them are of longer Duration in their native Countries, and might be so here, if they were placed in a warm Stove in Winter; but, as they perfect their Seeds the same Year, if the Plants are brought forward

in the Spring, few Persons have Room in their Stoves to receive these Plants, as there are so many perennial exotick Plants at present in the *English* Gardens, which require a warm Stove to preserve them.

These Plants are propagated by Seeds, which should be sown on a moderate hot Bed the Beginning of *April*, and when the Plants are come up fit to remove, they should be transplanted to another hot Bed, planting them 4 Inches Distance every Way; they must be shaded from the Sun till they have taken new Root, and then they must have a large Share of free Air admitted to them, when the Weather is mild, to prevent their drawing up weak; they will also require Water pretty frequently. If the Plants thrive well, they will have Strength enough to be fit to transplant in the open Air, for which Purpose they should be gradually hardened, and the Beginning of *June* they may be taken up with Balls of Earth to their Roots, and planted in a warm sheltered Part of the Garden, at about 3 Feet Distance, observing to shade and water them until they have taken new Root; after which they will require no other Care, but to keep them clean from Weeds. In *July* the Plants will begin to flower, and there will be a continued Succession of Flowers until the Frost comes on. If the Season proves warm, they will ripen their Seeds very well in Autumn, but lest these should miscarry by the Unfavourableness of the Season, it may be proper to put one Plant of each Sort in Pots filled with light Kitchen Garden Earth, placing them in the shade till they have taken new Root, and then they may be removed to a warm Situation, where they will thrive very well in a good Season, but if the Summer proves cold, they should be placed in a dry airy Glass, where they may be kept warm, which will ripen their Seeds.

The 18th Species will not flower the first Year, so the Plants must be placed in a warm Stove in Autumn, and during the Winter they must be treated as other tender Plants from the same Country. The following Summer they will flower and produce ripe Seeds, but the Plants are not of long Duration, so that there should be a Succession of young Plants raised from Seeds.

SIDERATION, a Blasting of Trees or Plants by an easterly Wind, or excessive Heat or Drought.

SIDERITIS. *Tourn. Inst. R. H. 191. Tab. 90. Lin. Gen. Pl. 632.* Ironwort; in *French*, *Crapaudine*.

The Characters are,

The Flower has an oblong tubulous Empalement of 1 Leaf, cut into 5 Segments at the Top. The Flower is of the Lip Kind, of 1 Petal, almost equal; the Tube is oblong and cylindrical, the Chaps oblong and taper. The upper Lip is erect, and cut into 2 acute Segments, the under Lip is cut into 3 Parts; the 2 Side Segments are acute, the Middle is round and crenated. It has 4 Stamina within the Tube, 2 of which are as long as the Tube, the other are shorter, terminated by 2 Twin Summits; and a four-pointed Germen, supporting a slender Style a little longer than the Stamina, crowned by 2 Stigmas, the upper being cylindrical, concave, and torn, the lower is short and membranaceous. The Germen afterward turns to 4 Seeds, which ripen in the Empalement.

The Species are,

1. SIDERITIS caulis birsutis procumbentibus, foliis oblongo-

oblongo-ovatis crenatis villosis, verticillis remotis. Ironwort with hairy trailing Stalks, oblong, oval, hairy, crenated Leaves, and the Whorls of Flowers far asunder. *Sideritis hirsuta procumbens.* C. B. P. 233. Hairy trailing Ironwort.

2. *SIDERITIS herbacea decumbens, calycibus spinosis labio superiore indiviso.* Lin. Sp. Pl. 575. Declining herbaceous Ironwort with prickly Empalements, and the upper-Lip of the Flower undivided. *Sideritis verticillis spinosis, minor procumbens.* Mor. Hist. 3. p. 388. Smaller trailing Ironwort with prickly Whorls.

3. *SIDERITIS foliis radicalibus oblongis hirsutis, caule glabro ramoso, verticillis omnibus remotissimis, calycibus spinosis.* Ironwort with oblong, hairy, lower Leaves, a smooth branching Stalk, the Whorls far asunder, and prickly Empalements. *Sideritis Orientalis, phlomidis folio.* Tourn. Cor. 12. Eastern Ironwort with a Jerusalem Sage Leaf.

4. *SIDERITIS tomentosa, foliis lineari-lanceolatis sessilibus, calycibus spinosis.* Woolly Ironwort with narrow Spear-shaped Leaves sitting close to the Stalks, and prickly Empalements to the Flowers. *Sideritis incana; oleæ folio.* Bocc. Mus. Hoary Ironwort with an Olive Leaf.

5. *SIDERITIS foliis lanceolatis subdentatis, bracteis cordatis dentato-spinosis, calycibus æqualibus.* Lin. Sp. Pl. 575. Ironwort with Spear-shaped Leaves slightly indented, Heart-shaped Bractæe prickly indented, and the Empalements of the Flower equal. *Sideritis foliis hirsutis profundè crenatis.* C. B. P. 233. Ironwort with hairy Leaves deeply crenated.

6. *SIDERITIS fruticosa tomentoso-lanata, foliis cuneiformibus sessilibus, calycibus inermibus.* Shrubby, downy, woolly Ironwort, with Wedge-shaped Leaves sitting close to the Stalks, and unarmed Empalements. *Sideritis Cretica tomentosa candidissima, flore luteo.* Tourn. Cor. 12. The whitest downy Ironwort of Candia.

7. *SIDERITIS fruticosa foliis lanceolatis integerrimis, floribus spicatis terminalibus, calycibus spinosis.* Shrubby Ironwort with Spear-shaped entire Leaves, and spiked Flowers terminating the Stalks, having prickly Empalements. *Sideritis Hispanica frutescens seu lignosior.* Tourn. Inst. 192. Shrubby or ligneous Spanish Ironwort.

8. *SIDERITIS herbacea, bipido-pilosa, foliis superioribus amplexicaulibus.* Lin. Sp. Pl. 575. Prickly, hairy, herbaceous Ironwort, whose upper Leaves embrace the Stalk. *Sideritis Persica, odorata, latissimo folio hirsuto, flore ex luteo albicante.* Boerb. Ind. alt. 1 p. 171. Sweet smelling Persian Ironwort, with a broad hairy Leaf, and a yellowish white Flower.

9. *SIDERITIS foliis lanceolatis glabris integerrimis, bracteis cordatis dentato-spinosis, calycibus equalibus.* Lin. Sp. Pl. 575. Ironwort, with smooth, entire, Spear-shaped Leaves, Heart-shaped, prickly, indented Bractæe, and equal Empalements. *Sideritis Alpina Hyssopifolia.* C. B. P. 233. Alpine Ironwort with a Hyssop Leaf.

10. *SIDERITIS fruticosa tomentosa, foliis cordatis, pedunculis ante florescentiam nutantibus.* Lin. Sp. Pl. 574. Shrubby woolly Ironwort with Heart-shaped Leaves, and Foot Stalks that nod before they flower. *Stachys Canariensis, frutescens, verbasci folio.* Tourn. Inst. 186. Shrubby Basethorehound of the Canaries with a Moth Mullein Leaf.

The 1st Sort grows naturally in France, Spain, and Italy; The Root is perennial, the Stalks are herbaceous, hairy, and trail on the Ground; they are a Foot and

a Half long, sending out Branches at the Bottom, garnished with oblong, oval, crenated Leaves that are hairy; the upper Part of the Stalk is furnished with Whorls of purplish Flowers, these stand pretty far asunder. The Flowers appear in Summer, and the Seeds ripen in Autumn. It is a Plant of no great Beauty or Use, so is seldom kept in Gardens.

The 2d Sort is an annual Plant with trailing Stalks; the Leaves are small, Spear-shaped, and sit close to the Stalks; the whole Plant is hairy. The Flowers grow in whorled Spikes at the End of the Branches, they have prickly Empalements and are yellow. It grows in all the Southern Parts of Europe, and is seldom admitted into Gardens.

The 3d Sort grows naturally in the Levant, where it was discovered by the late Dr. Tournefort. The Roots of this Sort seldom continue longer than 2 Years in England; the lower Leaves are oblong, entire, and hairy; the Stalks are smooth, hoary, and rise near 4 Feet high, branching out into several long slender Branches, garnished with hoary acute-pointed Leaves, and furnished with whitish Flowers in Whorls, placed far asunder; the Whorls are small, compact, and have 2 very short Leaves immediately under them, which end with a sharp Spine; the Empalements of the Flowers are prickly, and the Flowers small. This flowers in July, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in Crete; this is a low shrubby Plant, whose Stalks rise a Foot high and are ligneous, sending out Branches a Foot long, garnished with narrow Spear-shaped Leaves an Inch and a Half long, downy and very white; the upper Part of the Stalk is furnished with Whorls of whitish yellow Flowers, having prickly Empalements. This Sort Flowers in July, but unless the Season proves warm, the Seeds will not ripen here.

The 5th Sort grows naturally in the South of France and Italy; this hath a perennial Root; the Stalks rise a Foot high, and are garnished with Spear-shaped Leaves deeply crenated on their Edges; they are an Inch long and half an Inch broad, and have short Heart-shaped Bractæe which are prickly. The Flowers grow in whorled Spikes at the End of the Stalks, they are yellow, and have prickly Empalements which are equal. It flowers in July, and, if the Season proves warm, the Seeds will ripen in Autumn.

The 6th Sort grows naturally in Crete; this has a short ligneous Stalk, from which is sent out a few Branches about a Foot long, garnished with thick Wedge-shaped Leaves very downy and white. The Flowers are produced in Whorls toward the End of the Branches, they are yellow, and have smooth downy Empalements. It flowers in July, but does not produce Seeds in England.

The 7th Sort grows naturally in Spain and Italy; this has a low shrubby Stalk, sending out several hairy Branches a Foot long, garnished with hairy Spear-shaped Leaves, 1 Inch long and half an Inch broad, of a yellowish green Colour. The Flowers grow in close whorled Spikes at the End of the Branches, they are of a Sulphur Colour, and have very prickly Empalements. This Sort flowers in July, and the Seeds ripen in Autumn.

The 8th Sort grows naturally in *Perfia*; it is a biennial Plant with us in *England*, seldom continuing after it has ripened Seeds. The lower Leaves are oblong, broad at their Base, ending in obtuse Points, hairy, and have a strong Scent when rubbed. The Stalk rises 3 Feet high, and is covered with prickly Hairs; it branches out toward the Top, and is garnished with Heart-shaped Leaves, ending in acute Points, whose Bases embrace the Stalks. The Flowers grow in large Whorls toward the Top of the Stalk; the Whorls are placed near each other, and have 2 Heart-shaped pointed Leaves under each. The Tube of the Flower is long, the Flowers are of a yellowish white, and the upper Lip has two purple Stripes; the Empalements end in 5 soft acute Points. It flowers in *July*, and the Seeds ripen in Autumn.

The 9th Sort grows naturally on the Mountains of *Valentia*; this has a short ligneous Stalk, sending out Branches a Foot and a Half long, garnished with narrow smooth Leaves an Inch long, of a strong Scent when bruised. The Flowers are yellow, and grow in large spiked Whorls at the End of the Branches. It flowers in *June*, and the Seeds ripen in Autumn.

The 10th Sort grows naturally in the *Canary Islands*, but has been long an Inhabitant in the *English* Gardens. It rises with a soft shrubby Stalk 5 or 6 Feet high, sending out several ligneous Branches covered with a soft Down, and garnished with Heart-shaped Leaves, having long Foot Stalks. These differ greatly in Size, according to the Age and Vigour of the Plants; for in young Plants they are often 5 or 6 Inches long, and two and a Half broad near their Base; but in older Plants they are not more than half that Size; they are very woolly, especially on their under Side, which is white, but their upper Surface is of a dark yellowish green. The Flowers grow in thick whorled Spikes at the End of the Branches: they are of a dirty white, shaped like those of the other Sorts, and appear early in *June*, and the Seeds ripen in *August*, but the Plants frequently produce Flowers again in Autumn.

These Plants are preserved in some curious Gardens for Variety. The 5 Sorts first mentioned, and also the 8th and 9th, are hardy enough to thrive in the open Air in *England*: They are propagated by Seeds, which, if sown in Autumn, will succeed better than those sown in the Spring. The Seeds may be sown in shallow Drills on a dry Spot of Ground, and in the Spring when the Plants come up they must be kept clean from Weeds, and when the Plants are fit to remove, part of each Sort may be drawn out, and planted in a Bed about 9 or 10 Inches Distance, this will give those which are left in the Seed Bed Room to grow. The Plants which are removed should be shaded and watered until they have taken new Root, after which they will require no other Care, but to keep them clean from Weeds till the following Autumn, when they should be transplanted to the Places where they are to remain. The 4th Sort should have a dry Soil and a warm Situation, but neither of the Sorts should be planted in rich Ground, for that will cause them to grow so luxuriant in Summer, that the Frost or much Wet will destroy them in Winter.

The annual Sort should not be removed, but the

Plants thinned and left in the Place where they were sown, keeping them clean from Weeds.

The 6th and 7th Sort will often live through the Winter in the open Air, especially if their Seeds are sown upon dry Rubbish; for when either of these happen to grow in the Joints of old Walls, they will endure the greatest Cold of this Country, therefore their Seeds should be sown in such Places. The 6th Sort does not produce good Seeds in *England*, so this is propagated by slipping off the Heads, planting them in a shady Border during the Spring or Summer Months, which will readily take Root; some of these may then be taken up and put into Pots, that they may be screened under a Frame in Winter. The other may be removed in Autumn, and planted close to warm Walls in Rubbish, where they will abide some Years.

The 10th Sort is generally kept in Green-houses in *England*, but in moderate Winters I have had these Plants live abroad without Cover in a warm dry Border: However, if they are screened from hard Frost under a common Frame, where they may be exposed to the open Air at all Times when the Weather is mild, and protected from hard Frosts, they will thrive better than with more tender Treatment. It is propagated by Seeds which should be sown in Autumn, for those sown in the Spring seldom succeed, or if they do, the Plants rarely come up the first Year.

SIDEROXYLUM, Iron Wood.

The Characters are,

The Empalement of the Flower is permanent and consists of 1 Leaf, cut into 5 Segments. The Flower is Bell-shaped, and divided into 5 Parts at the Brim. It has 5 Awl-shaped Stamina the Length of the Petal, terminated by single Summits, and a round Germen supporting an Awl-shaped Style, crowned by a single Stigma. The Germen becomes a roundish Berry having one Cell containing 4 Seeds.

The Species are,

1. *SIDEROXYLUM inerme*. *Lin. Hort. Cliff.* 69. Smooth Iron Wood. *Sideroxylum primum* f. *dein coria* *Indorum nomine data arbor.* *Hort. Elth.* 357. The first Iron Wood, called by the *Indians* *Dein Coria*.

2. *SIDEROXYLUM foliis lanceolatis ex adverso sitis*. Iron Wood with Spear-shaped Leaves growing opposite.

These Plants grow naturally at the *Cape of Good Hope*, from whence they were first brought into the *Dutch* Gardens, and of late Years they have been introduced into several curious Gardens in *England*, where they are preserved for the Beauty of their ever-green Leaves, for they rarely produce Flowers here.

The 1st Sort hath large oval Leaves, shaped somewhat like those of the Bay Tree, but smoother and blunter at the End. These are placed on the Branches without Order, as the Branches also are produced. The Stalks are shrubby, and rise 5 or 6 Feet high, sending out many Branches, covered with a dark brown Bark.

The 2d Sort grows more upright and regular; the Leaves, which are smaller, and more pointed than those of the first, are placed opposite on the Branches, and these continue green through the Year.

The Wood of these Trees being very close and solid, has given Occasion for this Name being applied to them, it being so heavy as to sink in Water; and the Title of Iron Wood having been applied to the Wood,

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by the Inhabitants of the Countries where it grows, has occasioned the Botanist to constitute a Genus by this Name. But as the Characters of the Plants have not been so well examined as could be wished, occasioned by their not flowering in *Europe*, it is very probable, that the Plants which have been ranged under this Genus, do not properly belong to it; for Dr. *Plukenet* has figured a Plant under the Title of *Ebenus Jamaicensis*, whose Characters are very different from those assigned to this Genus: And the *Jamaica* Iron Wood is totally different from both in its Characters, for this has male and female Flowers on different Trees; the male Flowers have no petals, as appears by dried Samples in my Collection.

These Plants are Natives of warm Countries, so can not be preserved in *England*, unless placed in a warm Stove. They are propagated by Seeds, when they can be procured from Abroad. These must be sown in Pots filled with light rich Earth, and plunged into a good hot Bed in Spring, in order to get the Plants forward early in the Season. When they are fit to transplant, they should be each put into a separate small Pot filled with good Earth, and plunged into a fresh hot Bed. In the Winter they must be plunged into the Tan Bed in the Stove, and treated as hath been directed for several tender Plants from the same Countries. As the Plants obtain Strength, they may be treated more hardily, by placing them in the dry Stove in the Winter, and giving them a greater Share of free Air in Summer; but they must not be placed abroad, for they are too tender to live in the open Air in the Summer Season in *England*.

I have propagated them by Layers, but these were two Years before they had made good Roots; and sometimes they will take from Cuttings, but this is a very uncertain Method of propagating them; nor do the Plants so raised ever grow so vigorously as those which come from Seeds; so that when those can be procured, it is the best Method to propagate them.

SIGESBECKIA. *Lin. Sp. Pl.* 873.

The Characters are,

The proper Involucrum of the Flower is composed of 5 linear, taper, obtuse Leaves which open beyond the Petal, and is permanent. The common Cover is 5 leaved, sitting close; it has 5 Angles; the Leaves are oval, concave, equal, and disposed in several series; it is permanent, and between each Leaf is contained a Floret. The Flower is composed of hermaphrodite Florets in the Disk, and the Border or Ray is made up of female half Florets which are Tongue-shaped. The hermaphrodite Florets are Funnel shaped, and cut in 5 Parts at the Brim; these have 5 short Stamina, with tubulous Summits joined together, and an oblong incurved Germen as large as the Empalement, supporting a slender Style, crowned by a bifid Stigma. The Germen turns to an oblong, four-cornered blunt Seed; the female half Florets have a short, broad, Tongue-shaped Petal, indented in 3 Parts; these have a Germen, Style, and Stigma, like the hermaphrodite Florets, but no Stamina, and are succeeded by single Seeds like the other.

We have but one Species of this Genus, viz.

SIGESBECKIA. *Lin. Hort. Cliff. Sigesbeckia*. We have no *English* Name for this Plant; this here men-

tioned was applied to it by Dr. *Linnaeus*, in Honour of Dr. *Sigesbeck*, who was Professor of Botany at *Petersburgh*.

This Plant is annual, perishing at the Approach of Winter. The Seeds of it were brought from the *East-Indies*, where it is a troublesome Weed; but in *England* it will not prodece ripe Seeds, unless the Plants are raised on a hot Bed, and brought forward in the Spring; then they may be planted out in Warm Borders the Beginning of June, and if they are supplied with Water in dry Weather, they will grow near 4 Feet high, and send out many Branches. The Flowers are produced at the Extremity of the Shoots, which are small, and of a yellow Colour, so make no great Appearance; therefore it is only preserved in the Gardens of Persons, curious in the Study of Plants.

SILAUM. See *Peucedanum*.

SILENE. *Lin. Gen. Pl.* 503. *Viscago*. *Dill Hort. Elth.* 309. *Lychnis*. *Tourn. Inst. R. H.* 333. *Tab.* 175. Viscous Campion or Lychnis.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, indented at the Top in 5 Parts. It has 5 plain obtuse Petals indented at their Points, whose Tails are narrow, the Length of the Empalement, and a Nectarium compounded of 2 small Indentures in the Neck of each Petal, constituting a Crown to the Chaps; and 10 Awl-shaped Stamina inserted alternately to the Tail of the Petals above each other, terminated by oblong Summits. In the Center is situated a cylindrical Germen, supporting 3 Styles longer than the Stamina crowned by Stigmas that are reflexed against the Sun. The Germen becomes a close cylindrical Capsule with 3 Cells, opening at the Top five Ways, inclosing many Kidney-shaped Seeds.

The Species are,

1. SILENE petalis integerrimis subrotundis, fructibus erectis alternis. *Hort. Cliff.* 171. *Silene* with entire roundish Petals to the Flower, and erect Fruit alternate. *Lychnis hirsuta*, flore eleganter variegata. *Raii Hist.* 997. Hairy Campion with an elegant variegated Flower, commonly called Dwarf Lychnis.

2. SILENE floribus spicatis alternis secundis sessilibus, petalis bifidis. *Lin. Sp. Plant.* 416. *Silene* with Spikes of Flowers sitting close and turned all one Way, and the Petals bifid. *Viscago hirta noctiflora*, floribus obsoletis spicatis. *Dillen. Hort. Elth.* 420. Night flowering, hairy, viscous Campion, with worn-out Flowers in Spikes.

3. SILENE petalis bifidis, floribus lateralibus secundis cernuis, caule recurvato. *Lin. Sp. Pl.* 417. *Silene* with bifid Petals, nodding Flowers Growing from the Side of the Stalks all turned to one Side, and a recurved Stalk. *Lychnis montana*, viscosa, alba, latifolia. *C. B. P.* 205. Broad-leaved, white, viscous, Mountain Campion.

4. SILENE petalis bifidis, caule fruticoso, foliis late lanceolatis, panicula trichotoma. *Lin. Sp. Pl.* 417. *Silene* with bifid Petals, a shrubby Stalk, broad Spear-shaped Leaves, and Panicles divided in Threes. *Lychnis frutescens*, myrtifolia, behen albo similis. *C. B. P.* 205. Shrubby Campion with a Myrtle Leaf, like the white Behen.

5. SILENE foliis radicalibus coelebulariformibus obtusissimis, caule subverticillato. *Lin. Sp. Pl.* 418. *Silene* with the bluntest, Spoon-shaped, lower Leaves, and those upon the Stalks almost in Whorls. *Lychnis acymastis* facie,

facie, flore viridi. Herm. Par. 199. Campion with the Appearance of *Ocymastrum*, and a green Flower,

6. *SILENE calycibus fructus globosis acuminatis striis triginta, foliis glabris. Hort. Upsal. 110.* *Silene* with globular acute-pointed Capsules to the Fruit, having 30 Stripes, and smooth Leaves, *Lychnis sylvestris, latifolia, caliculis turgidis striatis. C. B. P. 205.* Broad-leaved wild Campion, with a turgid striped Empalement.

7. *SILENE calycibus fructus pendulis inflatis, angulis decem scabris. Hort. Upsal. 109.* *Silene* with pendulous swollen Empalements to the Fruit, with 10 rough Angles. *Lychnis supina, Sicula, calyce amplissimo striato. Tourn. Inst. R. H. 337.* Low Sicilian Campion, with a large striped Empalement.

8. *SILENE calycibus decem angularibus, dentibus tubum æquantibus. Lin. Sp. Pl. 419.* *Silene* with Empalements having 10 Angles, and the Indentures as long as the Tube. *Lychnis noctiflora. C. B. P. 205.* Night flowering Campion.

9. *SILENE calycibus fructus pyramidalis striatis, caulibus birsutis, foliis acuminatis glabris.* *Silene* with pyramidal striped Empalements to the Fruit, a hairy Stalk, and smooth acute-pointed Leaves. *Lychnis Orientalis, calyce pyramidato striato longissimo. Tourn. Cor. 24.* Eastern Campion, with a very long pyramidal striped Empalement.

10. *SILENE calycibus conicis striis birsutis, fructibus erectioribus, caule erecto birsuto, foliis nervosis.* *Silene* with conical Empalements having hairy Stripes, erect Fruit, a hairy upright Stalk, and veined Leaves. *Lychnis Orientalis, longifolia nervosa, flore purpurascens. Tourn. Cor. 24.* Eastern Campion with a long veined Leaf and a purplish Flower.

11. *SILENE petalis bifidis, caule dichotomo, floribus axillaribus sessilibus, foliis glabris. Lin. Sp. Pl. 420.* *Silene* with bifid Petals, a Stalk divided by Pairs, Flowers sitting close to the Wings of the Stalk, and smooth Leaves. *Lychnis sylvestris, viscosa, rubra altera. C. B. P. 205.* Wild viscid Campion with a red Flower.

12. *SILENE floribus fasciculatis fastigiatis, foliis superioribus cordatis glabris. Hort. Upsal. 110.* *Silene* with Flowers gathered into Bunches, whose upper Leaves are smooth and Heart-shaped. *Lychnis viscosa purpurea, latifolia levis. C. B. P. 205.* Purple viscid Campion with a broad smooth Leaf, commonly called *Loesel's Catchfly*.

13. *SILENE foliis radicalibus obtusis, caulibus lanceolatis oppositis, floribus axillaribus erectis, pedunculis subtrifloris.* *Silene* with obtuse lower Leaves, those upon the Stalks Spear-shaped and opposite, erect Flowers at the Wings of the Stalks, and Foot Stalks for the most part with three Flowers. *Lychnis facie auriculæ urfi. C. B. P. 206.* Campion with the Appearance of *Auricula*.

14. *SILENE caule folioso herbaceo, foliis lanceolatis acutis glabris calycibus erectis. Hort. Cliff. 171.* *Silene* with an herbaceous leafy Stalk, Spear-shaped, acute-pointed, smooth Leaves, and erect Empalements. *Lychnis Orientalis bupleuri folio. Tourn. Cor. 24.* Eastern Campion with a Hare's-ear Leaf.

There are several other Species of this Genus, whose Flowers have no Beauty, so the Plants are never cultivated but in Botanick Gardens for Variety, so I have chosen to omit them.

The 1st Sort grows naturally in *Portugal*, but has been long cultivated in the *English* Gardens by the Title of Dwarf *Lychnis*. The Seeds of this were formerly sown in Drills on the Edges of Borders, as were several other low annual Plants, these being very fashionable for Edgings of Borders at that Time; but as all these were of short Duration, so they soon were rejected for this Purpose; after which the Seeds were usually sown in Patches in the Borders, where they made a better Appearance than in the former Way; but in both these Methods the Plants were generally left so close as to spoil their Growth, for their Stalks were drawn up very weak, and had not Room to branch out, and their Flowers were small; therefore those who are desirous to have this Plant in Beauty, should sow the Seeds thin upon a Border of light Earth in Autumn, and in the Spring the Plants should be thinned to the Distance of 4 Inches, and keep them afterward clean from Weeds. When they are so managed, the Plants will rise near a Foot and a Half high, with hairy channelled Stalks, and divide into many Branches, garnished with oval Spear-shaped hairy Leaves placed opposite, sitting close to the Stalks. The Flowers grow in short Spikes at the End of the Branches, they are placed alternately, and are of a bright purple Colour, edged with white. The autumnal Plants will flower in *May* and *June*, but those sown in the Spring will come a Month later.

The 2d Sort grows naturally in *Sicily*, and also at the *Cape of Good Hope*, from whence I have received the Seeds. This is an annual Plant, with a low branching Stalk, which seldom rises more than 8 or 9 Inches high; the Stalks are smooth, the Leaves very narrow and smooth, placed by Pairs; the Stalks are terminated by Spikes of dark purple Flowers standing alternate, whose Petals are bifid; they open in the Evening, but are closely shut in the Day. If the Seeds of this Plant are sown in Autumn on a warm Border, the Plants will flower in *May* and in *June*, so good Seeds may be obtained; but when the Seeds are sown in the Spring, they often fail; and if any of the Plants do come up, they are generally so late that their Seeds seldom ripen well.

The 3d Sort is a perennial Plant which grows naturally on the *Alps*; the lower Leaves are smooth and Spear-shaped, the Stalk rises near 2 Feet high, and is garnished with 2 narrow Leaves placed opposite at each Joint, and immediately below them; the Stalk is very clammy. The Flowers come out on short Foot Stalks from the Wings of the Leaves, each Foot Stalk for the most Part sustaining 3 Flowers, with long white bifid Petals. These appear in *June*, and the Seeds ripen in *August*. This Plant rises easily from Seeds if they are sown in Autumn, and the only Culture the Plants require, is to keep them clean from Weeds, and allow them Room to spread; they love a cool Soil and a shady Situation.

The 4th Sort grows naturally in *Sicily*; this has a low shrubby Stalk, which divides into several short shrubby Stalks, garnished with broad, smooth, Spear-shaped Leaves, ending in acute Points. The Flower Stalks rise about a Foot high, and divide into spreading Panicles by Twos and Threes. The Flowers are of an herbaceous white Colour, they appear in *June* and *July*,
and

and are succeeded by oval smooth Capsules having thick Covers, filled with small Seeds which ripen in Autumn. This Sort rises easily from Seeds as the former, or may be propagated by Slips, which, if planted in a shady Border will take Root very freely; if the Plants are planted in a warm Border of dry Earth, they will live several Years and require no shelter, but in moist Ground they frequently rot in Winter.

The 5th Sort grows naturally in *Portugal*; this has a perennial Root, the lower Leaves are roundish and hollowed like a Spoon, those upon the Stalks are obtuse, and stand sometimes by Pairs, at others by Threes or Fours round the Stalks; they are of a deep green, smooth, and sit close to the Stalks; the Stalks are round, smooth, and rise from 2 to 3 Feet high. The Flowers grow in loose Spikes at the Top, they are of a green Colour and appear in *June*, and the Seeds ripen in *August*. This rises easily from Seeds sown in Autumn, and if the Plants have a dry Soil, they will continue several Years, and require no other Culture but to keep them clean from Weeds.

The 6th Sort grows naturally among Corn in *France*, *Spain*, and *Italy*. It is an annual Plant with an upright branching Stalk a Foot and a Half high, having swelling viscid joints, and garnished with narrow, acute-pointed smooth Leaves, near 3 Inches long, sitting close to the Stalks. The Flowers are produced at the End of the Branches, they are small and red; these are succeeded by globular Capsules ending in acute Points; whose Empalements are striped. It flowers in *June*, and the Seeds ripen in *August*. The Seeds of this should be sown in Autumn, and in the Spring the Plants should be thinned and kept clean from Weeds, which is all the Culture they require.

The 7th Sort grows naturally in *Sicily* and *Crete*; this is an annual Plant, from whose Root come out several branching Stalks near a Foot and a Half long, which trail on the Ground, and are garnished with oval, acute-pointed Leaves, placed opposite. The Flowers come out singly from the Wings of the Stalk, upon short Foot Stalks; they are large and of a bright red Colour, resembling those of the common wild red Campan. These appear in *May*, and are succeeded by large Capsules included in inflated Empalements, having 10 rough Angles, containing many large roundish Seeds, whose Weight causes the Capsules to hang downward. If the Seeds of this are permitted to scatter, the Plants will come up and increase without any Care but to keep them clean from Weeds.

The 8th Sort is an annual Plant, found in *England* growing among Corn. It rises with a thick clammy Stalk 8 or 9 Inches high, garnished with small oblong Leaves by Pairs, whose Bases embrace the Stalks; the Top of the Stalk sustains 1 or 2 small red Flowers, which open only in the Night. This Flowers in *June*, and the Seeds ripen early in *August*, which, if permitted to scatter, the Plants will come up without farther Trouble.

The 9th Sort grows naturally in the *Archipelago*; this rises with a hairy Stalk near a Foot and a Half high, garnished with narrow Spear-shaped Leaves placed by Pairs, which are smooth and sit close to the Stalks. The Flowers are disposed loosely at the Top

of the Stalks, they are red, and have long pyramidal striped Empalements. The Flowers appear in *June*, and the Seeds ripen in *August*. If the Seeds of this Sort, are sown in Autumn, and the Plants treated as the first, they will thrive and flower.

The 10th Sort grows naturally in the *Levant*; this is an annual Plant, with a strong, erect, hairy branching Stalk, which rises 2 Feet high. The Branches grow erect, as do also the Flowers, which are red, and have large conical striped Empalements, whose Stripes are hairy, and of a brownish Colour. The Flowers appear in *June*, and the Seeds ripen in *August*; this must be treated as the first Sort.

The 11th Sort grows naturally in the South of *France*, *Spain*, and *Italy*; this is biennial. The Stalk is round, clammy, and rises a Foot and a Half high, having swelling Joints; the Leaves grow round the Stalks in Clusters, they are very narrow and smooth. The upper Part of the Stalk divides into spreading Branches by Pairs, adorned by red Flowers coming out singly from the Wings of the Leaves, sitting close to the Stalks. These appear in *May*, and are succeeded by oblong viscid Capsules filled with angular Seeds, which ripen in *July*.

This Sort is easily propagated by Seeds, which, if sown in Autumn, will succeed much better than in the Spring. When the Plants come up and are fit to remove, they should be transplanted into a Bed of fresh Earth at 6 Inches Distance, shading them from the Sun, and watering them until they have taken new Root; after which they must be kept clean from Weeds till Autumn, when they should be transplanted to the Places where they are designed to remain for flowering. When the Seeds of this happen to scatter on a Wall, and plants arise there, they will continue much longer than in the Ground.

The 12th Sort is an annual Plant, which grows naturally in the South of *France* and *Italy*, but has been many Years cultivated in the *English* Gardens, from whence the Seeds have spread out upon Walls and Buildings so far, as to induce some to believe it a Native of *England*.

There are three Varieties of this, which generally retain their Differences; one has a bright purple Flower, the other a pale red, and the third a white Flower; these do not differ in any other Respect, so cannot be reckoned as different Species.

The Stalks grow erect a Foot and a Half high, the lower Leaves are broad, oblong, and smooth; those on the Stalks are Heart-shaped, smooth, and sit close to the Stalks: The Stalk for more than an Inch in Length below each Joint, is so glutinous, that the small Flies which light thereon are fastened and cannot get off again, from whence it had the Title of Catch-fly. The Flowers grow in Bunches at the Top of the Stalk, they stand erect, forming a Kind of Umbel. These appear in *June*, and are succeeded by slender oblong Capsules filled with angular Seeds, which ripen in *August*.

These Seeds should be sown in Autumn, for those sown in the Spring often fail; and if the Plants do come up, they never grow so large or make so good an Appearance, as the autumnal Plants.

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The 13th Sort is biennial; this grows naturally in *Sicily*, and *Crete*; the lower Leaves are obtuse, and are gathered in circular Heads like some of the Houseleeks, or those of the Auricula; they are smooth and of a pretty thick Consistence. The Stalks rise 5 or 6 Feet high, are very viscous, and garnished with Spear-shaped Leaves placed opposite. The Flowers come out upon short Foot Stalks from the Wings of the Stalks, each Foot Stalk sustaining 3 or 4 greenish Flowers; these are succeeded by oval Capsules which spread open at the Top, and are filled with angular Seeds.

If the Seeds of this Plant are sown in Autumn upon a warm Border, they will more certainly succeed than those sown in the Spring. When the Plants come up and are fit to remove, they should be planted on a dry Soil and in a warm Situation, where they will live through the Winter, and the following Summer they will flower and ripen their Seeds, and then decay.

The 14th Sort grows naturally in the *Levant*; this has a perennial Root; the lower Leaves are narrow, Spear-shaped, and smooth; they are gathered in clustered Heads, from the Middle of which arises an erect clammy Stalk a Foot and a Half high, garnished with very narrow Leaves. The Flowers come out from the Wings of the Leaves toward the Top of the Stalk; their Foot Stalks are short, and each sustains two white Flowers having long Tubes standing erect; the Flowers are closed in the Day, and expand at Night. This flowers in *July*, but rarely produces ripe Seeds in *England*.

As the Seeds seldom ripen here, so it is difficult to propagate it: The only Way is to slip off the Heads in *June*, and plant them under a Glass; these will take Root, if they are shaded from the Sun and duly watered.

SILER. *Dod. Ligusticum. Tourn. Inst. R. H. 323. Laserpitium. Lin. Gen. Pl. 306. Sermountain.*

The Characters are,

It is a Plant with an umbellated Flower. The principal Umbel is composed of many smaller, and these are composed of a great Number of Flowers. The Involucrum of the general Umbel is composed of many short, broad obtuse Leaves, those of the particular Umbels are composed of 8 acute-pointed Leaves; the principal Umbel is uniform. The Flowers have 5 Petals, whose Points are inflexed, Heart-shaped, and equal. They have 5 slender Stamina the Length of the Petal terminated by single Summits, and an oblong Germen situated under the Flower supporting 2 Styles, crowned by obtuse Stigmas. The Germen becomes an oblong Fruit with 8 narrow membranaceous Wings, and is divided into 2 Parts, containing 2 oblong Seeds, which are half cylindrical, plain on one Side but have 2 membranaceous Borders on the other.

The Species are,

1. **SILER** foliis duplicato pinnatis, foliolis ternis lanceolatis integerrimis sessilibus. *Siler* with doubly winged Leaves, the Lobes by Threes which, are Spear-shaped, entire, and sit close to the Stalks. *Siler montanum. Dod. Pempt. 310. Mountain Siler, Sefeli, or Sermountain.*

2. **SILER** foliis duplicato pinnatis, foliis ternis quinifove, lanceolatis integerrimis, umbellis minoribus. *Siler* with doubly winged Leaves whose Lobes are placed by Threes and Fives, are Spear-shaped, entire, and the Umbels smaller. *Ligusticum sive Siler montanum angustifolium. C. B. P. 162. Narrow-leaved Sermountain.*

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3. **SILER** foliis duplicato pinnatis, foliolis quinis linearilanceolatis integerrimis, umbella maxima. *Siler* with doubly winged Leaves, the Lobes placed by Fives, which are linear, Spear-shaped, entire, and the largest Umbel. *Ligusticum Pyrenaicum, amplissimo tenuique folio. Tourn. Inst. R. H. 323. Pyrenean Sermountain* with an ample narrow Leaf.

The 1st Sort is used in Medicine, by the Direction of the College of Physicians. The Seeds of this Sort are the *Semen Seseleos* of the Shops, which enters in Compositions; and the green Herb is also used, for which some of the People who supply the Shops, often impose on their Customers the Mountain Osier, which, by translating *Siler* an Osier, may afford them some Pretence.

This Sort grows naturally on the Mountains *Jura* and *Saleva* near *Geneva*, and in many Parts of the *Alps*. The Root is perennial, composed of many thick, rugged, fleshy Fibres, which strike deep in the Ground. The Stalks rise 4 Feet high, and branch out upward into many Foot Stalks, each being terminated by a large Umbel of white Flowers. The Leaves stand on very long Foot Stalks, whose Bases embrace the Stalks, and divide first into 3 smaller, and the middle Foot Stalk divides again into 3 smaller, and these are again divided into small Foot Stalks, which sustain 3 Spear-shaped entire Lobes; the middle one which is the largest, is 2 Inches and a Half long, and almost 1 broad, the other are less; they are stiff, of a gray Colour, and sit close to the Foot Stalks. The principal Umbel of Flowers, is composed of 34 small Umbels; the Involucrum of the great Umbel is composed of 10 short blunt Leaves alternately larger; these, after the Flowers are blown, are reflexed back to the Foot Stalk; the particular Umbels have long Foot Stalks, which spread out from one Center in Rays, and are nearly equal, so that the principal Umbel is uniform; the Involucra of these are composed of 7 short acute-pointed Leaves. The Flowers have 5 Heart-shaped Petals a little inflexed, these are succeeded by oblong channelled Fruit having 5 narrow membranaceous Borders, which divide into 2 Seeds, plain on the Sides which join, but channelled on the other. This Plant flowers in *June*, and the Seeds ripen in *August*.

The 2d Sort grows naturally in *Austria* and *Bohemia*; the Root is like the former, the Stalks not so thick, but nearly as tall; the Foot Stalks of the Leaves divide into 3 as the former, and the Middle one is again divided into 3 smaller, which divide into small Foot Stalks, that for the most part sustain 5 Lobes, but there are some which have but three. The Lobes are an Inch and a Half long, and half an Inch broad; they are of a brighter gray than those of the other, and not so stiff. The Umbels are composed of about 12 or 14 small Umbels, all of them much less than those of the former. The Plant flowers, and the Seeds ripen about the same Time as the other.

This Sort never alters to the first, for I have many Years raised both Sorts from Seeds, and have not observed either to change

The 3d Sort grows naturally on the *Pyrenean* Mountains; this has a strong perennial Root like the 2 former, the Stalks rise 5 or 6 Feet high, and sustain very large Umbels of Flowers. The Leaves are very large, being

being composed of many Divisions of the Foot Stalks, which are again divided into smaller; these sustain 5 narrower Lobes than either of the former. This Sort flowers in June, and the Seeds ripen in August.

These Plants may be propagated by Seeds, which should be sown in Autumn soon after they are ripe, on a Border of fresh undunged Earth; and in the Spring, when the Plants will appear, they should be kept constantly clear from Weeds; and in very dry Weather should be watered, which will greatly promote their Growth. Where the Plants come up too close together, they should be thinned, so as to leave them 3 or 4 Inches apart, which will be sufficient Room for them the first Season; and at Michaelmas when their Leaves decay, some of the Plants may be carefully taken up, so as not to cut or break their Roots, and transplanted into a moist shady Border, about 3 Feet asunder, where they may remain for Continuance. If these Plants thrive well, they will produce Seeds the second Season, otherwise it will be the third Summer before they flower and seed; after which the Roots will abide many Years, and greatly increase in their Size, and will produce Seeds every Year.

The Culture which these Plants require, is only to keep them clear from Weeds; and every Spring, just before the Plants put out their Leaves, to dig the Ground between them gently, so as not to injure their Roots; and when the Flower Stems are advanced, to place some Sticks down by them, to which their Stems should be fastened with Bals, to support them from being broken down by Winds; for as these Stems rise to the Height of 4 or 5 Feet, so when their Umbels of Seeds are formed, which are generally pretty large and heavy, they often occasion their Stems falling to the Ground, where they are not supported.

SILIQUEA. See Ceratonia.

SILICUASTRUM. See Cercis.

SILICOUS, is Plants whose Seeds are in a Husk, Pod, or Shell.

SILPHIUM. Lin. Gen. Pl. 882. *Cbrysanthemum*. Mor. Hist. 3. Bastard Chrysanthemum.

The Characters are,

The common Empalement of the Flower is oval, imbricated, and permanent; the Scales are oval, prominent, and reflexed in the Middle. The Disk of the Flower is composed of hermaphrodite Florets which are tubulous, of 1 Leaf, indented in 5 Parts at the Top. These have 5 short Hair-like Stamina, terminated by cylindrical Summits, and a slender taper Germen supporting a long hairy Style, crowned by a single Stigma; these are barren. The Rays of the Flower are composed of a few female half Florets, which are long, Spear-shaped, and for the most part have 3 Indentures at their Points; these have a Heart-shaped Germen, with a short single Style, having 2 bristly Stigmas of the same Length. These are succeeded by single Heart-shaped Seeds with a membranaceous Border, indented at the Top, each Point ending with a Horn or Tooth, and separated by linear Chaff, ripening in the Empalement.

The Species are,

1. *SILPHIUM foliis binis, ternis quaternisq.* Silphium with Leaves by Pairs, Threes and Fours at a Joint. *Cbrysanthemum Virginianum, foliis asperis tribus vel quaternis ad genicula suis.* Mor. Hist. 3. p. 24. Virginian

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Corn Marygold, with rough Leaves placed by Threes or Fours at a Joint.

2. *SILPHIUM foliis indivisis sessilibus oppositis, inferioribus alternis.* Lin. Sp. Pl. 920. Silphium with undivided Leaves set opposite close to the Stalks, whose lower Leaves are alternate. *Asteriscus coronæ folis folio & facie.* Hort. Elth. 42. *Asteriscus* with the Leaf and Appearance of Sunflower.

3. *SILPHIUM foliis oppositis petiolatis serratis.* Flor. Virg. 181. Silphium with sawed Leaves having Foot Stalks which grow opposite. *Cbrysanthemum Marianum virgæ aureæ Americanæ foliis, florum petalis tridentatis.* Pluk. Mant. 46. Maryland Corn Marygold, with an American golden Rod Leaf, and the Petals of the Flower indented in three Parts.

4. *SILPHIUM foliis lanceolatis alternis scabris, obsolete serratis, caule fruticoso.* Silphium with rough Spear shaped Leaves placed alternate, which have slight sawed Edges, and a shrubby Stalk. *Corona folis Americana arborescens, flore parvo luteo, semine alato.* Houtt. Mss. Tree American Sunflower, with a small yellow Flower and a winged Seed.

The 1st Sort grows naturally in many Parts of North America; the Root is perennial and ligneous, the Stalks are annual; these rise 5 Feet high or more, in good Land; they are of a purplish Colour, and branch toward the Top. The Leaves are oblong, rough, and have some sharp Teeth on their Edges; they are from 3 to 4 Inches long, and almost 2 broad; toward the Bottom of the Stalk, they stand by Fours round it at each Joint; higher up they are by Threes, and at the Top by Pairs, sitting close to the Stalks. The Flowers stand on pretty long Foot Stalks, each sustaining one Flower, whose Empalement is composed of 3 Orders of Leaves placed imbricatum, like the Scales of Fish, the outer Order being the smallest. The Ray or Border of the Flower is composed of 13 female half Florets, which are yellow, Tongue-shaped, and indented in 3 Points at the End. The Disk or Middle of the Flower is made up of hermaphrodite tubulous Flowers, slightly cut into 5 Parts at Top; these have 5 Stamina and a Style connected together, which are longer than the Tube of the Floret. This Plant flowers in July and August, and when the Autumn proves warm, it will produce ripe Seeds.

It is propagated by parting the Roots, as is practised for the perennial Sunflowers; the best Time for this is in Autumn, when their Stalks begin to decay, The Plants may afterward be treated as the perennial Sunflower.

The 2d Sort grows naturally in Carolina; the Root of this is perennial, the Stalk is thick, solid and set with prickly Hairs; it rises near 3 Feet high, and has many purple Spots; the Leaves on the lower Part of the Stalk are placed alternate, but upward they are opposite, and sit close to the Stalk; they are rough, about 2 Inches long, and one broad near their Base, having a few slight Indentures on their Edges. The upper Part of the Stalk divides into 5 or 6 small Branches, terminated by yellow radiated Flowers, like those of the perennial Sunflower but smaller, having generally 9 female half Florets, which compose the Border or Ray, the other Parts are like those of the former Sort. It flowers in

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August, but the Seeds do not ripen in *England*. This Sort is propagated by parting the Roots as the former, but as this is not quite so hardy, it should be planted in a sheltered Situation.

The 3d Sort grows naturally in many Parts of *North America*; this is a perennial Plant, whose Stalks rise near 3 Feet, and are garnished with oblong sawed Leaves placed by Pairs, upon short Foot Stalks. The Flowers are loosely disposed at the Top of the Stalks, they are yellow, and have their half Florets which compose the Ray, indented in three Parts at the End. This Plant flowers in *August*, but the Seeds do not ripen here. It may be propagated as the former, and the Plants require the same Treatment.

The 4th Sort was discovered growing naturally at *La Vera Cruz* in *New Spain*. This rises with a shrubby Stalk 8 or 10 Feet high, sending out ligneous Branches, garnished with Spear-shaped Leaves placed alternately on every Part of the Stalk; they are 4 Inches long, and 1 and a Half broad in the Middle, ending in acute Points; their Surface is rough, and their Edges slightly sawed. The Flowers are produced at the End of the Branches, some singly on slender Foot Stalks, others are by 2 or 3 on each Foot Stalk; they are unequal in Height, and have short scaly Empalements. The Florets are short which compose the Ray, and those of the Disk are more prominent than those of the other Sorts. They are of a deep yellow Colour, but are not succeeded by Seeds in *England*.

This Sort is with Difficulty propagated here, for unless the Seeds are procured from the Country where the Plants grow naturally, they cannot be obtained that Way, and the Cuttings are not apt to take Root. The only Method of getting them to grow, is to slip off the young Shoots in *July*, and plant them in a Pot filled with soft Loam, and plunge the Pot into a gentle hot Bed, covering the Pot closely with a Bell or Hand Glass, and shade them from the Sun. When the Cuttings are rooted, they should be each planted in a separate Pot filled with light loamy Earth; and during the warm Months, they may be placed in the open Air in a warm Situation, but in Winter they should be kept in a moderate Stove.

SINAPIS. *Lin. Gen. Pl.* 735. *Sinapi. Tourn. Inst. R. H.* 227. *Tab.* 112. Mustard; in *French*, *Moutarde*.

The Characters are,

The Empalement of the Flower is composed of 4 narrow Leaves placed in Form of a Cross, which spread open and fall off. The Flower has 4 roundish Petals in Form of a Cross, and 4 oval Nectaria, one on each Side of the short Stamina and the Pointal, and one on each Side of the longer Stamina and the Empalement. It has 6 Awl-shaped erect Stamina, 2 of which are opposite and as long as the Empalement, the other 4 are longer. In the Center is placed a taper Germen, with a Style the Length of the Germen, crowned by a beaded Stigma. The Germen afterward turns to an oblong Pod, which is very rough at Bottom, having 2 Cells, opening with 2 Valves, whose intermediate Partition is large, compressed and almost twice the Length of the Valves, and the Seeds are globular.

The Species are,

1. SINAPIS *siliquis hispida, rostro obliquo longissimo.* *Hort. Cliff.* 338. Mustard with prickly Pods, and a

very long oblique Beak. *Sinapi apii folio. C. B. P.* 96. Mustard with a Smallage Leaf, commonly called white Mustard.

2. SINAPIS *siliquis glabris tetragonis.* *Hort. Cliff.* 338. Mustard with a smooth four-cornered Pod. *Sinapi rapi folio. C. B. P.* 99. Mustard with a Rape Leaf, or common Mustard.

3. SINAPIS *siliquis multangulis toroso-turgidis, rostro longioribus.* *Hort. Cliff.* 338. Mustard with many angled rough swelling Pods, having a longer Beak. *Sinapi arvense præcox, semine nigro, foliis integris.* *Tourn. Inst.* 226. Early Field Mustard, with a black Seed and entire Leaves.

4. SINAPIS *siliquis teretibus glabris obtusis.* Mustard with taper obtuse smooth Pods. *Sinapi Hispanicum, pumilum album.* *Tourn. Inst.* 227. Low white Spanish Mustard.

5. SINAPIS *ramis fasciculatis, foliis summis lanceolatis integerrimis.* *Hort. Upsal.* 191. Mustard with bundled Branches, and the upper Leaves Spear-shaped and entire. *Sinapi Indicum maximum, lacinae folio.* *Par. Bat.* 230. Greatest Indian Mustard with a Lettuce Leaf.

6. SINAPIS *foliis duplicato-pinnatis, laciniis linearibus.* *Hort. Cliff.* 338. Mustard with doubly winged Leaves, having linear Segments. *Sinapi Hispanicum nasturtii folio.* *Tourn. Inst.* 227. Spanish Mustard with a Cress Leaf.

The 1st Sort is the common white Mustard, generally cultivated as a Salad Herb for Winter and Spring Use. This rises with a branched hairy Stalk 2 Feet high, the Leaves are deeply jagged on their Edges and are rough. The Flowers are disposed in loose Spikes at the End of the Branches standing on horizontal Foot Stalks; they have 4 yellow Petals placed in Form of a Cross, which are succeeded by hairy Pods that end with long, compressed, oblique Beaks; the Pods generally contain 4 white Seeds. It flowers in *June*, and the Seeds ripen in *August*.

The 2d Sort is the common Mustard, frequently found growing naturally in many Parts of *England*, but is also cultivated in Fields for the Seed, of which the Sauce called Mustard is made. This rises with a branching Stalk 4 or 5 Feet high; the lower Leaves are large, rough, and very like those of Turnep, the upper Leaves are smaller and less jagged. The Flowers are small, yellow, and grow in spiked Clusters at the End of the Branches; they have 4 Petals placed in Form of a Cross, these are succeeded by smooth four-cornered Pods. It flowers and seeds at the same Time with the former.

The 3d Sort grows naturally on arable Land in many Parts of *England*. The Seed of this is commonly sold under the Title of *Durham Mustard Seed*; of this there are 2 Varieties, if not distinct Species; one with cut, and the other has entire Leaves. The Stalks rise about 2 Feet high, the Leaves are rough, and in one they are jagged like Turnip Leaves, and the others are oblong and entire. The Flowers are yellows the Pods are turgid, angular, and have long Beaks. These Flower in *April* and *May*, and the Seeds ripen in *June*.

The 4th Sort grows naturally in *Spain*; this seldom rises more than 8 or 9 Inches high, the Leaves are smooth and much jagged, the Stalk branches toward the Top, and is terminated by a loose Spike of white Flowers;

ers; these are succeeded by smooth, taper, blunt Pods, filled with small brown Seeds. It flowers in June, and the Seeds ripen in August.

The 5th Sort grows naturally in China, from whence the Seeds are frequently brought to England. This Plant is used as a boiled Sallad by the Chinese, where it may prove acceptable to those who have not better Herbs for that Purpose, but in England it is not regarded. The Stalks of this rise 3 Feet high, and toward the Bottom are garnished with broad, smooth, jagged Leaves, but those at the Top are entire. The Flowers are yellow like those of the first Sort, and the Pods are smooth and turgid. It flowers in June, and the Seeds ripen in August.

The 1st Sort is chiefly cultivated in Gardens, for a Sallad Herb in the Winter Season. The Seeds of this are commonly sown very thick in Drills, either on a warm Border or in very cold Weather on a moderate hot Bed, with Cressles and other small Sallad Herbs, which are commonly fit for Use in 10 Days or a Fortnight from the Time of sowing; for if they are large and have rough Leaves, they are too strong to put into Sallads. In order to save the Seeds of this Plant, a Spot of Ground must be sown with it in the Spring, and when the Plants have 4 Leaves the Ground should be hoed as for Turneps, to cut down the Weeds, and thin the Plants where they are too close; this should be done in dry Weather, for then the Weeds will soon die after they are cut. If this is well performed, the Ground will remain clean for a Month, by which Time young Weeds will spring up again; therefore the Ground should be again hoed over, and the Plants left about 8 or 9 Inches asunder which will be sufficient Room for this Sort to grow; if this is well performed in dry Weather, the Ground will remain clean till the Seeds are ripe. As soon as the Pods change brown, the Plants should be cut off and spread upon Cloths two or three Days to dry, and then threshed out for Use.

The 2d Sort is cultivated only for the Seeds; these should be sown as those of the first, and the Plants treated in the same Manner, with this Difference of allowing the Plants twice as much Room, because they grow much larger, so these should be hoed out to the Distance of 18 Inches; and as the Seeds will not ripen so soon as the other, to the Ground may require to be hoed 3 Times over, but that may be easily seen by the Growth of the Weeds.

The Seeds of these two first Species are ordered for medicinal Use.

The 3d Sort is a pretty common Weed on arable Lands in most Parts of England; this comes up early in the Spring amongst the Corn, so flowers and seeds in May; therefore where it is not weeded out, the Seeds will scatter long before the Corn is ripe, and the Ground will be stocked with the Weed.

The other three Sorts are preserved in Botanick Gardens for Variety, but are never cultivated for Use; these may be treated as the two first Species.

SINAPISTRUM. See Cleome.

SISARUM. See Sium.

SISON. Lin Gen. Pl. 311. Sii species. Tourn. Inst. R. H. 308. Bastard stone Parsley; in French Berie.

The Characters are,

It has umbellated Flower; the general Umbel is composed of 6 thin Rays or small Umbels, which are unequal, as are also the smaller, which have ten. The Involucra of both are four-leaved and unequal; the Empalement of the Flower is scarce discernible. The outer Petals of the general Umbel are uniform; the Flowers have 5 equal Petals which are Spear-shaped and inflexed. They have 5 Hair-like Stamina the Length of the Petals, terminated by single Summits. The oval Germen is situated under the Flower, supporting 2 reflexed Styles crowned by obtuse Stigmas. The Germen becomes an oval streaked Fruit dividing in 2 Parts, each containing 1 oval streaked Seed, convex on one Side and plain on the other.

The Species are,

1. SISON foliis pinnatis, umbellis erectis. Prod. Leyd. 105. Sison with winged Leaves and erect Umbels. Sium aromaticum, sison officinarum. Tourn. Inst. 308. Bastard Stone Parsley, or spurious Amomum.

2. SISON foliis pinnatis, umbellis cernuis. Prod. Leyd. 105. Sison with winged Leaves and nodding Umbels. Sium arvense, five segetum. Tourn. Inst. 308. Honewort, or Corn Parsley.

3. SISON foliis ternatis Hort. Cliff. 99. Sison with trifoliate Leaves. Myrrhis Canadensis trilobata. Mor. Hist. 3. p. 301. Canada Myrrh with trilobate Leaves.

4. SISON foliolis verticillatis capillaribus. Lin. Sp. Plant. 253. Sison with Hair-like small Leaves in Whorls. Carui foliis tenuissimis asphodeli radice. Tourn. Inst. 306. Narrow-leaved Carraway with an Asphodel Root.

The 1st Sort grows on the Side of Ditches, and moist shady Banks, in many Parts of England; it is a biennial Plant, which perishes soon after the Seeds are ripe. The Root is taper, running deep into the Ground; the lower Leaves are winged, they are composed of 4 Pair of Lobes terminated by an odd one; these are an Inch and a Half long, and half an Inch broad, regularly indented on both Sides, and the Indentures sawed; they are of a lucid green, and have an aromack Odour. The Stalks rise 3 Feet high, and branch out on every Side; they are garnished with Leaves of the same Form with these below, but smaller; at the End of the Branches, the Flowers are produced in small Umbels. The Flowers are white, they appear in June and are succeeded by striated Seeds of a hot pleasant aromack Smell and Taste, which ripen in August.

This Plant is found growing so plentifully wild, as that it is rarely kept in Gardens; but whoever is willing to propagate it should sow the Seeds in Autumn, in a moist shady Spot of Ground, where the Plants will come up, and require no farther Care, than to keep them clean from Weeds; and if the Seeds are permitted to scatter, the Plants will rise without Care. The Seeds of this Plant is put into Venice Treacle, for a Succedaneum to the true Amomum.

The 2d Sort grows naturally among Corn on moist Land, in several Parts of England. This is also a biennial Plant, which decays soon after the Seeds are ripe; it rises with an upright Stalk about a Foot high, which rarely divides into Branches; the Leaves stand on pretty long Foot Stalks, they are winged, but the Lobes are smaller and finer cut than those of the former;

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the Umbels of Flowers are more compact, and nod on one Side. It flowers and feeds about the same Time as the former, and the Plant may be cultivated in the same Way.

The 3d Sort grows naturally in North America, but is preserved by those who are curious in Botany in their Gardens. This has a perennial Root; the Stalk rises a Foot and a Half high, and is garnished with trifoliate Leaves, whose Lobes are oval, Spear-shaped and sawed on their Edges; they are about 3 Inches long, and one and a Half broad; their Foot Stalks are set with bristly Hairs, and their Base inclosed by a membranaceous Sheath which half embraces the Stalk. The Flowers are in Umbels which terminate the Stalks, and there are small ones which come from the Wings of the Stalk; they are very irregular in their Form. The Flowers are white, appear in June, and are succeeded by oblong streaked Seeds which ripen in August.

The 4th Sort grows naturally on the Alps and Apennines; this rises with a swelling jointed Stalk, near 2 Feet high, garnished with very fine slender Leaves, standing in Whorls like those of the Water Milfoil; it branches out toward the Top, each Branch being terminated by a pretty large Umbel of Flowers, purplish on their Outside but white within; these appear the latter End of May, and the Seeds ripen the End of July. The Roots of this Plant are composed of thick fleshy Knots somewhat like those of the Kings Spear.

These two last mentioned Sorts may be cultivated by Seeds, which should be sown in Autumn, for those sown in Spring seldom grow the first Year. The Plants require no other Culture than to thin them where too close, and keep them clean from Weeds; they both delight in a moist Soil and a shady Situation, where the Roots will continue several Years.

SISYMBRIUM. Tourn. Inst. R. H. 225. Tab. 109. Lin. Gen. Pl. 728. Water Cresses.

The Characters are,

The Flower has a spreading Empalement composed of 4 linear, Spear-shaped, coloured Leaves, which fall off; it has 4 oblong spreading Petals placed in Form of a Cross, and 6 Stamina, 4 of which are longer than the Empalement, the other 2, which are opposite, are shorter, and terminated by single Summits; it has an oblong slender Germen, with scarce any Style, crowned by an obtuse Stigma. The Germen becomes a taper oblong incurved Pod bearing 2 Cells, opening with 2 Valves shorter than the intermediate Partition, and filled with small Seeds.

The Species are,

1. SISYMBRIUM *siliquis declinatis, foliis pinnatis, foliolis subcordatis*. Hort. Cliff. 336. *Sisymbrium* with declining Pods, and winged Leaves whose Lobes are almost Heart-shaped. *Nasturtium aquaticum supinum*. C. B. P. 104. Water Cress.

2. SISYMBRIUM *siliquis declinatis, foliis pinnatis, foliolis lanceolatis serratis*. Hort. Cliff. 336. *Sisymbrium* with declining Pods, and winged Leaves having Spear-shaped sawed Lobes. *Eruca palustris, nasturtii folio, siliqua oblonga*. C. B. P. 98. Marsh Rocket with a Cress Leaf, and a long Pod.

3. SISYMBRIUM *siliquis declinatis, oblongo-ovatis, foliis pinnatifidis serratis*. Lin. Sp. Pl. 657. *Sisymbrium*

with oblong, oval, declining Pods, and Wing-pointed sawed Leaves. *Rapbanus aquaticus, foliis in profundas lacinas divisis*. C. B. P. 97. Water Radish with Leaves deeply cut.

4. SISYMBRIUM *foliis simplicibus dentatis serratis*. Hort. Cliff. 336. *Sisymbrium* with single indented sawed Leaves. *Rapbanus aquaticus alter*. C. B. P. 97. Another Water Radish.

5. SISYMBRIUM *siliquis axillaribus sessilibus subulatis aggregatis, foliis repando-dentatis*. Hort. Upsal. 193. *Sisymbrium* with Awl-shaped Pods in Clusters sitting close to the Stalks, and indented Leaves which turn backward. *Erysimum polyceratum vel corniculatum*. C. B. P. 101. Many-podded or horned Hedge Mustard.

6. SISYMBRIUM *petalis calyce minoribus, folis decomposito pinnatis*. Flor. Suec. *Sisymbrium* with Petals smaller than the Empalement, and decomposed winged Leaves. *Erysimum sophia dictum*. Raii. Syn. Ed. 3. p. 298. Hedge Mustard, called *Sophia* or *Flixweed*.

7. SISYMBRIUM *foliis pinnato-hastatis flaccidis, foliolis sublinearibus integerrimis, pedunculis laxis*. Hort. Upsal. 193. *Sisymbrium* with Spear, Wing-pointed, flaccid Leaves having linear entire Lobes with loose Foot Stalks. *Rapistrum italicum siliquis longissimis*. C. B. P. 95. Italian Charlock with very long Pods.

8. SISYMBRIUM *foliis pinnato-hastatis dentatis, siliquis erectis*. Lin. Sp. Pl. 659. *Sisymbrium* with Spear-shaped, winged, indented Leaves, and erect Pods. *Erysimum latifolium, majus glabrum*. C. B. P. 131. Smooth greater, broad-leaved Hedge Mustard.

9. SISYMBRIUM *foliis lanceolatis dentato-serratis caulinis*. Hort. Cliff. 337. *Sisymbrium* with Spear-shaped, winged, indented Leaves on the Stalks. *Hesperis lutea, siliquis strictissimis*. Tourn. Inst. 222. Yellow Rocket with closed Pods.

The 1st Sort is the common Water Cress, found in Ditches and Rills of Water in most Parts of England. The Roots of this Plant are composed of a great Number of long Fibres, which fasten themselves to the Mud at the Bottom of the Ditches from which arise several Stalks garnished with winged Leaves, composed of 5 or 6 Pair of Lobes, which are roundish and almost Heart-shaped, terminated by an odd one; these stand almost alternate along the Mid-rib. The Stalks rise a Foot and a Half high; they are hollow, channelled, and divide at the Top into 2 or 3 Branches, terminated by loose Spikes of small white Flowers, composed of 4 Petals placed in Form of a Cross; these appear the Beginning of June, and are succeeded by taper Pods filled with small brown Seeds which ripen in July.

This Plant has of late Years been generally used as Sallad Herbs in the Spring of the Year, and is by many preferred to all other Sorts of Sallads for the agreeable warm bitter Taste, and, being accounted an excellent Remedy for the Scurvy, and to cleanse the Blood, as also a good Diuretick, it has greatly obtained a Preference to most other Herbs for Winter and Spring Use with most People. This is generally gathered in the Ditches, and in other standing Waters near London, to supply the Markets, but whoever has a Mind to cultivate it may easily do it, by taking some of the Plants, from the Places of their natural Growth, early in the Spring, being careful to preserve their Roots as entire

entire as possible, and plant them into Mud, and then let the Water in upon them by Degrees. When they have taken Root, they will soon flourish, and spread over a large Compass of Water; they should not be cut the first Season but suffered to run to Seed, which will fall into the Water and furnish a sufficient Supply of Plants afterward.

But where the Water is so deep that it will not be easy to plant them, the best Method will be to get a Quantity of the Plants just as their Seeds are ripening, and throw them on the Surface of the Water, where they are designed to grow, and their Seeds will ripen, and fall to the Bottom, where they will take Root, and produce a Supply of these Plants. These Plants produce Seed in July, which is the proper Time for this Work.

Some of those People who gather this Herb for Use, either through Ignorance or some worse Design, have frequently taken the creeping Water Parsnep, and sold it for Water Cress, whereby many Persons have suffered who have eaten it, therefore those, who make Use of Water Cress, should be careful to have the right Plant; they may be easily distinguished by the Shape of their Leaves, those of the Water Cress having roundish almost Heart-shaped small Leaves or Lobes, with a few Indentures on their Edges, and are of a dark green Colour, but those of the Water Parsnep have oblong Lobes ending in Points; they are of a light green, and sawed on their Edges.

The 2d Sort grows naturally on the Borders of the River Thames, and in some other Parts of England. The Leaves of this Sort are longer than those of the 1st; the Lobes are much narrower, and sawed on their Edges; the Flowers stand on longer Foot Stalks, and are much smaller. This spreads and multiplies as the first.

The 3d and 4th Sorts grow naturally on the Banks of the Thames, and in Ditches in many Parts of England, so are not admitted into Gardens.

The 5th Sort grows naturally in the South of France and Italy; it is an annual Plant, whose Stalks spread and decline toward the Ground; they grow a Foot long, and divide into many Branches, garnished with smooth Leaves, shaped like the Point of a Halberd, deeply sinuated on their Borders, and indented, whose Indentures turn backward. The Flowers come out in Clusters at the Wings of the Stalk; they are small, yellow, and are succeeded by slender crooked Pods standing in Clusters; they appear in June and July, and the Seeds ripen in August and September.

The 6th Sort grows naturally in uncultivated Places, and also by the Side of Footways, in many Parts of England. The Leaves of this are divided into many very narrow Segments; the Stalks rise a Foot and a Half or better; they are garnished with winged Leaves, whose Lobes are finely cut, resembling those of the true Roman Wormwood. The Flowers are produced in loose Spikes at the Top of the Stalk; they are small, yellow, and composed of four Petals set in Form of a Cross; these appear in June, and are succeeded by slender Pods filled with small roundish Seeds, which ripen in August, and then the Plant dies. The Seeds of this Plant are used in Medicine, and are by some greatly recommended for the Gravel and Stopages of Urine.

The 7th Sort grows naturally in France and Italy. The lower Leaves are flaccid, and cut in Form of winged Leaves ending in Arrow-pointed Lobes. The Stalk rises near 3 Feet high, garnished with linear Wing-pointed Leaves; it branches out greatly on every Side; the Flowers grow sparsely toward the End of the Branches, which are succeeded by very long slender Pods, which are smooth, filled with small yellowish Seeds. It flowers in June, the Seeds ripen in August, and the Plant dies soon after.

The two last are preserved in Botanick Gardens for Variety. If their Seeds are permitted to scatter, the Plants will come up in Plenty, and require no other Care but to thin them, and keep them clean from Weeds, or if their Seeds are sown in Autumn, they will succeed better than in the Spring.

The 8th Sort grows naturally in many Parts of England, so is seldom admitted into Gardens; this is an annual Plant which sows itself, and comes up without Care. It was remarked, after the great Fire of London, that this Plant came up in great Plenty on the Ruins.

The 9th Sort grows naturally on the Helvetic Mountains; this hath a perennial Root, from which arise several branching Stalks near 3 Feet high, garnished with Spear-shaped Leaves, about 3 Inches long and 1 broad, sawed on their Edges, and of a deep green, standing alternately on the Stalks. The Flowers grow in loose Spikes at the Top of the Stalks; they are small, yellow, and composed of 4 Petals placed in Form of a Cross; these appear in June, and are succeeded by taper Pods filled with small Seeds which ripen in August.

This is preserved in some Gardens for Variety, but it has no great Beauty; it is propagated by Seeds, which succeed best when sown in Autumn, for those sown in the Spring seldom come up the same Year. The Plants require no Care, and love a cool shady Situation.

SISYRINCHIUM Lin. Gen. Pl. 908. Bermudiana. Tourn. Inst. R. H. 387. Tab. 208.

The Characters are,

The Sheath, which incloses the Flowers, faces both Ways, and is composed of 2 compressed Keel-shaped Leaves. The Flower has 6 oblong Petals which spread open, and have an acute Point, and 3 very short Stamina terminated by bifid Summits fixed to the Base of the Style, with an oval Germen situated under the Flower, supporting an Awl-shaped Style, crowned by a trifid reflexed Stigma. The Germen turns to an oval three-cornered Capsule with 3 Cells filled with roundish Seeds.

The Species are,

1. SISYRINCHIUM foliis gladiolatis amplexicaulis, pedunculis brevioribus. Sisyrinchium with Sword-shaped Leaves embracing the Stalks, and shorter Foot Stalks, to the Flower. Bermudiana iridis folio fibrosa radice. Inst. R. H. 338. Bermudiana with an Iris Leaf and a fibrous Root.

2. SISYRINCHIUM foliis lineari-gladiolatis, pedunculis longioribus. Sisyrinchium with linear Sword-shaped Leaves, and longer Foot Stalks to the Flower. Bermudiana graminea, flore minore ceruleo. Hort. Elth. 49. Grass-leaved Bermudiana with a smaller blue Flower.

3. SISYRINCHIUM foliis plicatis, spatula biflora. Sisyrinchium with a plaited Leaf and two Flowers in a Sheath.

Sheath. *Bermudiana palmæ folio, radice bulbosa*. Lign. Tourn. Inst. 381. *Bermudiana* with a Palm Leaf and a bulbous Root.

The 1st Sort grows naturally in *Bermuda*, from whence it had the Title of *Bermudiana* given it by *Tournefort*; this has a fibrous Root, from which arise some stiff Sword-shaped Leaves, 4 or 5 Inches long and Half an Inch broad of a dark green Colour and entire; between these come out the Stalk which rises 6 Inches high; it is compressed, and has 2 Borders or Wings running the whole Length, and 3 or 4 Sword-shaped Leaves which embrace it; these grow erect, and are hollowed like the Keel of a Boat. The Stalk is terminated by a Cluster of 6 or 7 Flowers, standing on short Foot Stalks, inclosed by a two leaved Keel-shaped Sheath before they open; the Flowers are of a deep blue Colour with yellow Bottoms; they are composed of 6 oval Petals ending in acute Points; they spread open, and the Flowers, when fully expanded are an Inch over. In the Center is situated an upright Style, at the Bottom of which are 3 Stamina whose Summits sit close to it and the Top has a Stigma cut into 3 Parts which are reflexed back to the Style; these are of a Gold Colour. The Flowers appear in *June*, and, when they fall away, the Germen, which was situated under, turns to an oval obtuse Capsule with 3 Cells filled with roundish Seeds.

The 2d Sort grows naturally in *Virginia*; this has a perennial fibrous Root, from which arise many very narrow Spear-shaped Leaves about 3 Inches long, and scarce an 8th Part of an Inch broad, of a light green Colour, and entire. The Stalks rise about 3 Inches high; they are very slender, compressed and bordered like those of the first, and have short narrow Sword-shaped Leaves, whose Bases embrace them; they are terminated by 2 small pale blue Flowers inclosed in a 2-leaved Sheath, standing on longer Foot Stalks than those of the other, which flower about the same Time, and their Seeds ripen in *August*.

These two Species have been blended together by many Botanists, who, it is very probable, have not seen them both, or at least have not had an opportunity of cultivating them, for those, who have, can be under no Doubt of their being distinct Species. I have cultivated both in the same Soil and Situation upward of 20 Years, during which Time I frequently raised both Sorts from Seed, and have never observed either of them alter. The Leaves, Stalks, and Flowers of the first are 3 Times as large as those of the second, and the Sheath incloses 6 or 7 Flowers whereas those of the second have rarely more than two, and these do not expand but for a short Time in the Morning, whereas those of the first Sort continue open the whole Day.

These Plants are propagated by Seeds, and by parting their Roots; if they are raised from Seeds, these should be sown in Autumn, soon after they are ripe, on an East aspected Border, where they may have only the Morning Sun: The best Way will be to sow them in Drills at 3 or 4 Inches Distance, covering them about half an Inch with light Earth. In the Spring the Plants will appear, when their Leaves will have much Resemblance to Grass, therefore Care should be

taken that they are not pulled up as Weeds by those who clean the Ground. During the first Summer they will require no other Care, but to keep them clean from Weeds, unless the Plants should come up so close as not to have Room to grow, in which Case, Part of them should be drawn out to give Room to the others, and these may be planted in a shady Border at 3 Inches Distance, where they may remain till Autumn, when they should be transplanted to the Places where they are to remain, and the following Summer they will flower. These Plants love a shady Situation and a soft loamy undunged Soil.

The Time for transplanting and slipping the old Roots is early in Autumn, that they may get good Roots before Winter. They are both so hardy as to thrive in the open Air in *England*, and are very rarely injured by Cold.

The 3d Sort grows naturally in the *West-Indies* this has a small oval bulbous Root covered with a bright red Skin, from which come out the Leaves very like the first Leaves of Palm Trees, but of a thinner Substance; they are 9 or 10 Inches long and 1 broad, having 5 or 6 longitudinal Plaits; they are of a light green, ending with Points, and 2 Leaves embrace each other at their Base; between these arises the Foot Stalk of the Flower, which is 4 Inches long, and sustains at the Top 2 or 3 small blue Flowers inclosed in a Spatha or Sheath; these are composed of 6 Petals which expand like those of the other Sorts, but do not continue open longer than 3 or 4 Hours in the Morning, and are closed up the Remainder of the Day, and when they are expanded, their Petals are so small as to make but little Appearance. This Sort flowers commonly in the Middle of Summer, but does not keep any particular Month; they are never succeeded by Seeds in *England*.

This is propagated by Offsets from the Roots, which are sent out in Plenty; these should be taken off when the Roots are transplanted: The Time for doing this is soon after the Leaves decay, or before the Roots begin to shoot again. They must be planted in small Pots filled with light loamy undunged Earth, and plunged into the Tan Bed in the Stove, where they should constantly remain, for they are too tender to thrive in this Country unless thus treated. Their after Management is the same as for other bulbous-rooted Plants from the same Countries.

Sisyrinchium. Tourn. or Spanish Earth Nut, is by Dr. Linnaeus referred to the Genus *Iris* or *Fleur-de-lis*, but, as it is a Plant that will not live long in a Garden, I have omitted mentioning it in this Work.

SIUM. Tourn. Inst. R. H. 308. Tab. 162. Lin. Gen. Pl. 310. *Sisfarum*. Tourn. Inst. 308, Tab. 163. Water Parineps and Skirrets; in French, *Cbervi*.

The Characters are,

It hath an umbellated Flower; the general Umbel is various in different Species; the small ones are plain and spreading. The general Involucrum is composed of several short Spear-shaped reflexed Leaves; those of the smaller are of very small narrow Leaves. The general Umbel is uniform; the Flowers have 5 inflexed Petals which are equal they have 5 Stamina terminated by single Summits, and a small Germen situated under the Flower, supporting 2 reflexed

2 reflexed Styles, crowned by obtuse Stigmas. The Germen becomes a roundish, oval, streaked Fruit splitting in two, each Part containing 1 streaked Seed, plain on 1 Side, and convex on the other.

The Species are,

1. *Sium foliis pinnatis, umbella terminali.* Hort. Cliff. 98. *Sium* with winged Leaves, and the Stalk terminated by an umbel. *Sium latifolium.* C. B. P. 154. The great Water Parsnep.

2. *Sium foliis pinnatis serratis, umbella terminali.* *Sium* with winged sawed Leaves, and Umbels terminating the Stalks. *Sium sive apium palustre, foliis oblongis.* C. B. P. 154. Common upright Water Parsnep.

3. *Sium foliis pinnatis, umbellis axillaribus sessilibus.* Hort. Cliff. 98. *Sium* with winged Leaves and Umbels of Flowers sitting close to the Wings of the Stalks. *Sium umbellatum repens.* Ger. Emoc. 256. 258. Creeping Water Parsnep.

4. *Sium foliis pinnatis, floralibus ternatis.* Hort. Cliff. 98. *Sium* with winged lower Leaves, but those under the Flowers trifoliate. *Sisarum Germanorum.* C. B. P. 155. Germen Skirrets.

5. *Sium foliolis linearibus decurrentibus connatis.* Hort. Cliff. 98. *Sium* with linear small Leaves having running Membranes, and join at their Base round the Stalk. *Ammi perenne.* Mor. Umb. Perennial Bishops-weed.

6. *Sium foliis radicalibus ternatis, caulinis bipinnatis.* Prod. Leyd. 105. *Sium* with trifoliate Bottom Leaves, and those on the Stalks doubly winged. *Myrrhis foliis pastinacae late virentibus.* Tournef. Cor. 33. Myrrh with light green Parsnep Leaves.

The 1st Sort is the great Water Parsnep, which grows naturally in deep Waters in several Parts of England; it rises with upright Stalks 5 or 6 Feet high, garnished with large winged Leaves shaped like those of the common Parsnep, and the Stalk is terminated by large Umbels of pale yellow Flowers. This Plant flowers in June and July, and the Seeds ripen the End of August; it is never cultivated in Gardens.

The 2d Sort is the common upright Parsnep, which grows naturally in Ditches in most Parts of England; this rises with an upright branching Stalk near 3 Feet high, garnished with winged Leaves composed of 3 or 4 Pair of oblong sawed Lobes, terminated by an odd one. The Stalk is terminated by an Umbel of white Flowers which appear in June, and are succeeded by Seeds which ripen in Autumn; this is rarely cultivated as it is a common Weed in Ditches and standing Waters. Both these Plants have been recommended by ancient Physicians for their Virtues in Medicine, but at present they are seldom used.

The 3d Sort is very common in standing Waters in most Parts of England. The Stalks spread over the Surface, and produce Umbels of white Flowers at their Joints. This is the Plant which is frequently gathered and sold for Water Cress, as is before mentioned under the Articles *Sisymbrium*.

The 4th Sort is the common Skirret, which was formerly more cultivated in the English Gardens than at present. The Roots are the only Part used, and although it is mentioned in most Dispensaries as a medicinal Plant, yet it is rarely used as such, being better adapted for the Kitchen. It is esteemed a wholesome Root,

affording good Nourishment, but has a Flatulency, and its very sweet Taste is disagreeable to many Palates.

The Root of this Plant is composed of several fleshy Fibres, as large as a Man's little Finger, which join together in one Head. The lower Leaves are winged, having 2 or 3 Pair of oblong Lobes terminated by an odd one; the Stalk rises a Foot high, and is terminated by an Umbel of white Flowers which appear in July, and are succeeded by striated Seeds like those of Parsley which ripen in Autumn.

This Plant is cultivated two Ways, first by Seeds, and afterward by Slips from the Root: The former Method I think the more eligible, because the Roots, which are raised from Seeds, generally grow larger than those raised by Slips, and are less subject to be sticky. The Seeds should be sown the latter End of March or the Beginning of April, either in broad Cast or in Drills; the Ground should be light and moist, for in dry Land the Roots are generally small, unless the Season proves very moist. If the Seeds are good, the Plants will appear in 5 or 6 Weeks after they are sown, and, when they have put out their Leaves so as to be well distinguished from the Weeds, the Ground should be hoed over to destroy the Weeds as is practised for Carrots, and where the Seeds are sown in broad Cast, the Plants should be cut up, leaving them at the same Distance as Carrots. Those sown in the Drills should also be thinned to the Distance of 4 Inches, and the Ground hoed over to destroy the Weeds. This should be repeated 3 Times, as is usually done for Carrots, which, if well performed in dry Weather, will keep the Ground clean all the first Part of the Summer, so that, unless there should be much Rain about Midsummer, there will be scarce any Necessity for farther cleaning the Plants, for their Leaves will spread, and prevent the Growth of Weeds afterward. In Autumn, when the Leaves begin to decay, the Roots will be fit for Use, and may be continued all the Winter till they begin to shoot in the Spring, when they will become sticky, as will also any of those which run up to Seed the first Summer, so that all such should be pulled up and thrown away.

The Time for propagating this Plant by offsets is in the Spring, before they begin to shoot, at which Time the old Roots should be dug up, and the Side Roots slipped off, preserving an Eye or Bud to each; these should be planted in Rows 1 Foot asunder, and 4 Inches distant in the Rows. If the Ground is light, this may be performed with a Dibble, but for stiff Land it will be best to make a Trench with a Spade, as for *Asparagus*, laying the Roots therein at a proper Distance. The Ground must be kept clean by hoeing it as before directed, and at the Season the Roots will be fit for Use.

The 5th Sort is a perennial Plant which grows naturally in Germany. The Roots of this Plant creep and spread very far under Ground; the least Part of them will grow, so that when it is once brought into a Garden, it will soon multiply; they are thick, fleshy and taste like those of *Eryngo*. The Leaves are divided into linear Segments, and their Bases embrace the Stalks, which rise 2 Feet high, and are terminated by large flat Umbels.

Umbels of white Flowers which appear in July, but their Seeds do not often ripen here.

The 6th Sort grows naturally in Sicily, and is preserved in Botanick Gardens for Variety. The lower Leaves are pretty broad, trifoliate, and of a lucid green; the Stalk rises 2 Feet high, and is terminated by an Umbel of yellow Flowers in July; the Leaves on the Stalks are doubly winged, and the Seeds ripen in Autumn, which should be sown soon after they are ripe.

SMALLAGE. See Apium.

SMILAX. Tourn. Infl. R. H. 654. Tab. 421. Lin. Gen. Pl. 992. Rough Bindweed.

The Characters are,

It is male and female in different Plants. The male Flowers have a 6 leaved, open, Bell-shaped Empalement; they have no Petals, but have 6 Stamina terminated by oblong Summits. The female Flowers have the like Empalement, but they fall off; they have no Petals or Stamina, but have an oval Germen, supporting 3 very small Styles, crowned by oblong reflexed Stigmas. The Germen turns to a globular Berry, with 2 Cells containing 2 globular Seeds.

The Species are,

1. SMILAX caule aculeato angulato, foliis dentato aculeatis cordatis. Lin. Sp. Pl. 1028. Smilax with an angular prickly Stalk, and Heart-shaped, prickly, indented Leaves. Smilax aspera, fructu rubente. C. B. P. 296. Rough Bindweed with a red Fruit.

2. SMILAX caule aculeato angulato, foliis cordatis inermibus. Smilax with an angular prickly Stalk, and smooth Heart-shaped Leaves. Smilax orientalis, sarmentis aculeatis, exelsis arbores scandentibus, foliis non spinosis. Tourn. Car. 45. Eastern rough Bindweed with prickly Runners climbing the tallest Tress, and Leaves not prickly.

3. SMILAX caule aculeato angulato, foliis inermibus retuso-cordatis. Smilax with an angular prickly Stalk, and retuse, Heart-shaped unarmed Leaves. Smilax viticulis asperis Virginiana, folia baderaceo leni Zorza nobilissimo. Pluk. Alm. 348. Virginia rough Bindweed with prickly Vines, and a smooth Ivy Leaf, called Zorza.

4. SMILAX caule aculeato tereti, foliis inermibus cordatis oblongis multinerviis. Lin. Sp. Pl. 1030. Smilax with a taper prickly Stalk, and oblong, Heart-shaped, unarmed Leaves with many Veins. Smilax bryonia nigra foliis, caule spinoso, baccis nigris. Catesb. Carol. 1. p. 52. Rough Bindweed with black Briony Leaves, a prickly Stalk, and black Berries.

5. SMILAX caule aculeato teretiusculo, foliis inermibus ovato-cordatis. Lin. Sp. Pl. 1029. Smilax with a taper prickly Stalk, and oval Heart-shaped unarmed Leaves. Radix China. C. B. P. 496. China Root.

6. SMILAX caule subaculeato tereti, foliis inermibus cordatis trinerviis. Smilax with a taper Stalk having a few small Thorns, and unarmed Heart-shaped Leaves with 3 Veins.

7. SMILAX caule aculeato tereti, foliis inermibus sagittatis obtusiusculis trinerviis. Smilax with a prickly taper Stalk, and very blunt, Halbert-pointed, unarmed Leaves. Smilax aspera aristolochiae foliis longioribus, ad basin auriculatis. Houst. Mss. Rough Bindweed with longer Birthwort Leaves eared at their Base.

8. SMILAX caule aculeato tereti, foliis ovato-lanceolatis

nerviis foliorum inferne aculeatis. Smilax with a taper prickly Stalk, and oval Spear-shaped Leaves whose Veins on the under Side are prickly. Smilax viticulis asperis, foliis oblongis, nervis foliorum spinosis. Houst. Rough Bindweed with a prickly Stalk, and oblong Leaves with prickly Veins.

9. SMILAX caule aculeato angulato, foliis lanceolatis inermibus, acuminatis. Smilax with an angular prickly Stalk, and Spear-shaped, acute-pointed, unarmed Leaves. Smilax viticulis asperis Virginiana, foliis angustis levibus nullis auriculis praedita. Pluk. Phyt. Tab. 110. fig. 4. Virginia rough Bindweed with prickly Veins, and narrow smooth Leaves without Ears.

10. SMILAX caule inermi tereti, foliis inermibus ovato-cordatis quinquenerviis floribus corymbosis. Rough Bindweed with a taper unarmed Stalk, oval Heart-shaped unarmed Leaves, and Flowers in a Corymbus.

11. SMILAX caule inermi tereti, foliis inermibus ovatis trinerviis. Smilax with an unarmed taper Stalk, and oval unarmed Leaves with 3 Veins. Smilax Virginiana, spinis innocuis armata latius canellae foliis, radice arundinacea crassa & carnosa. Pluk. Phyt. 110. fig. 5. Rough Bindweed of Virginia armed with innocent Spines, a broad Cinnamon Leaf, and a thick fleshy Reed-like Root.

12. SMILAX caule inermi tereti, foliis inermibus oblongo-cordatis trinerviis. Smilax with a taper unarmed Stalk, and oblong, Heart-shaped, unarmed Leaves with 3 Veins. Smilax laevis tamni foliis, claviculis longioribus. Houst. Smooth Bindweed with black Briony Leaves, and longer Claspers.

13. SMILAX caule inermi tereti, foliis inermibus ovato-cordatis trinerviis, floribus corymbosis. Smilax with a taper unarmed Stalk, oval, Heart-shaped, unarmed Leaves and Flowers in a Corymbus. Smilax humilis, non spinosa, foliis aristolochiae, baccis rubris. Catesb. Car. 1. p. 47. Dwarf Rough Bindweed without Spines, Birthwort Leaves, and red Berries.

14. SMILAX caule inermi tereti, foliis inermibus cordato-oblongis trinerviis cum acumine. Smilax with a taper unarmed Stalk, and Heart-shaped oblong Leaves having 3 Veins, ending with an acute Point. Smilax laevis, folio tamni latissimo, auriculis ad basin rotundioribus. Houst. Smooth Bindweed with the broadest black Briony Leaf with rounder Ears at the Base.

15. SMILAX caule inermi tereti, foliis inermibus, caulibus cordatis, racemis ovato-oblongis. Lin. Sp. Pl. 1031. Smilax with an unarmed taper Stalk, unarmed Heart-shaped Leaves on the Stalks, and oval oblong Bunches of Flowers. Smilax claviculata, baderae folia tota laevis & terrae Mariana. Pluk. Phyt. Tab. 225. fig. 3. Rough Bindweed with Claspers, and an Ivy Leaf totally smooth from Maryland.

16. SMILAX caule inermi tereti, foliis inermibus lanceolatis. Smilax with a taper unarmed Stalk, and Spear-shaped unarmed Leaves. Smilax laevis, lauri folio, baccis nigris. Catesb. Car. 1. p. 15. Smooth Bindweed with a Bay Leaf, and black Berries.

The 1st Sort grows naturally under Hedges and in Woods in Italy and Spain. The Roots are composed of many thick fleshy Fibres, which spread wide on every Side, and strike deep in the Ground, from which come out several Stalks which are slender, angular, armed with short crooked Spines, and have Claspers on

on their Sides, by which they fasten themselves to any neighbouring Plant for Support, and rise 5 or 6 Feet high. The Leaves are stiff, Heart-shaped, and acute-pointed, about 3 Quarters of an Inch broad at their Base, where they are eared, drawing narrower to a Point, and about 2 Inches long; they are of a dark green and have 5 longitudinal Veins; their Edges are set with a few short reddish Spines. The Flowers come out from the Wings of the Stalk in short Bunches; they are small and whitish, having no Petals. Those on the female Plants are succeeded by red Berries which ripen in Autumn.

The 2d Sort grows naturally in *Syria*. The Roots are like those of the former; the Stalks are four-cornered and prickly; these fasten themselves to the Trees near them by their Claspers, and mount to their Tops. The Leaves are Heart-shaped, 2 Inches long, and an Inch and three Quarters broad at their Base; they have no Spines on their Edges, but have 5 Veins running Lengthways. The Flowers and Fruit are like those of the first Sort.

The 3d Sort grows naturally in *Virginia*. The Roots of this are like those of the former; the Stalks are angular and prickly; the Leaves Heart-shaped, turning backward, and unarmed; the Flowers are small, and come out in long loose Bunches from the Wings of the Stalks; the Berries are small and red.

The 4th Sort grows naturally in *Carolina*. The Roots are like the former; the Stalks are taper and prickly; the Leaves oblong, Heart-shaped, four Inches long, and two Inches and a Half broad at their Base, having no Spines, but longitudinal Veins; the Flowers come out in long loose Bunches from the Side of the Stalks, and the Berries are black.

The 5th Sort grows naturally at *Cartagena* in *New Spain*. The Roots are like the former; the Stalks are taper, very strong, and armed with short stiff Spines; they fasten themselves by their Claspers to the neighbouring Trees, and rise 20 Feet high. The Leaves are of a thick Substance, and have no Spines; they are oval, Heart-shaped, 4 Inches long, and 3 and a Half broad at their Base, ending in an obtuse Point, and have 3 longitudinal Veins. The Flowers are like those of the other Species, but grow in close Bunches, and the Berries are red. This is the same with a Plant which I received from *China* by the Title of *China Root*.

The 6th Sort grows naturally at *Cartagena* in *New Spain*; this has very strong taper Stalks, armed with a very few short Spines. The Leaves are thick, unarmed, and Heart shaped; they are 5 Inches long, and 3 and a Half broad at their Base, ending with an acute Point. This Sort climbs on the neighbouring Trees, and rises 30 Feet high. The Flowers of this I have not seen.

The 7th Sort grows naturally at *La Vera Cruz* in *New Spain*; this hath a thick taper prickly Stalk, which climbs up the neighbouring Trees to the Height of 30 or 40 Feet. The Leaves are thick, stiff, and unarmed; they are 7 Inches long, and have 2 round Ears at their Base, where they are 3 Inches and a Half broad, but the other Part of the Leaves are 2 Inches broad to their Top, where they are rounded; they have 3 longitudinal Veins, and stand on short Foot Stalks.

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The 8th Sort grows naturally at *La Vera Cruz*; this has slender, taper, prickly Stalks, which fasten themselves to any neighbouring Support by their Claspers, and rise 8 or 10 Feet high. The Leaves are oval, Spear-shaped, 4 Inches and a Half long, and 2 and a Half broad in the Middle; they have no Spines on their Edges, but their Mid-rib and Veins on the under Side are armed with short reddish Spines.

The 9th Sort grows naturally in *Jamaica*. The Stalks are slender, angular, and prickly; the Leaves are Spear-shaped, ending in acute Points; they are 3 Inches long, and half an Inch broad, having no Spines; their Base is a little rounded, but have no Ears.

The 10th Sort grows naturally at *La Vera Cruz* in *New Spain*. The Stalks of this are taper and unarmed; the Leaves are oval, Heart-shaped, near 5 Inches long, and 3 and a Half broad, having 5 longitudinal Veins; they have no Spines, and stand on short Foot Stalks. The Flowers come out from the Wings of the Stalk in round Bunches, which are succeeded by red Berries.

The 11th Sort grows naturally in *Jamaica*; this has thick fleshy creeping Roots. The Stalks are taper and unarmed; these climb up the neighbouring Trees and Bushes to the Height of 10 or 12 Feet. The Leaves are oval, and end in acute Points; they are 5 Inches long, and 3 broad, and have 3 longitudinal Veins, but have no Spines.

The 12th Sort grows naturally in *Jamaica*. The Stalks are very slender and taper, having no Thorns; these branch out greatly, and rise over the neighbouring Bushes, having very long Claspers, which twine about their Branches. Their Leaves are oblong, Heart-shaped, 4 Inches long and 2 and a Half broad at their Base, having 3 longitudinal Veins ending in acute Points; they are of a lucid green, and pretty thick Consistence.

The 13th Sort grows naturally in *Carolina*; this has taper unarmed Stalks which rise 3 or 4 Feet high. The Leaves are oval, Heart-shaped, about 3 Inches long, and almost 2 broad, rounded at their Points, and have 3 longitudinal Veins. The Flowers come out from the Wings of the Stalk at every Joint, standing on short Foot Stalks, formed in a round Bunch; these are succeeded by roundish red Berries.

The 14th Sort grows naturally in *Jamaica*. The Stalks of this are taper, branching, and unarmed; the Leaves are Heart-shaped, oblong, and have 3 longitudinal Veins; they are 8 Inches long, and 5 and a Half broad at their Base, ending with an acute Point, of a lucid green, and stand upon short Foot Stalks.

The 15th Sort grows naturally in *Jamaica*, and also in *Maryland*. The Stalks are ligneous, taper, and unarmed; these have very long Claspers, by which they fasten to any neighbouring Support, and rise 20 Feet high. The Leaves are some oval, and others are Heart-shaped; they are about 3 Inches and a Half long, and 2 and a Half broad. The Flowers come out from the Wings of the Stalk in oblong Bunches; these are succeeded by red Berries.

The 16th Sort grows naturally in *Carolina*; this has a thick taper unarmed Stalk, which rises by the Help of neighbouring Bushes and Trees 10 or 12 Feet high. The Leaves are thick, Spear-shaped and unarmed,

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about 3 Inches and a Half long, and 1 Inch and a Half broad. The Flowers come out from the Wings of the Stalk in round Bunches, which are succeeded by black Berries.

These Plants are many of them preserved in the Gardens of the Curious for Variety, but some of them may be disposed so as to make them ornamental, for those Sorts, which grow naturally in *North America*, and the two first Sorts, are so hardy as to thrive in the open Air in *England*, and, as they retain their Verdure all the Year, if they are placed on the Borders of Woods or Groves in Gardens, and their Branches properly supported, they will screen the Nakedness of the Ground under the Trees from Sight, and in Winter, when their Leaves are in Beauty, they will make a pleasing Variety, when properly intermixed with other Evergreens, and, as some of the Sorts will rise 5 or 6 Feet high, they will shut up from View any disagreeable Objects.

Those Sorts, which require a Stove to protect them in Winter, are little esteemed, because they require much Room, and their Flowers have no Beauty to recommend them, so they are rather the proper Furniture of Botanick Gardens than those of Pleasure.

They are all propagated by Seeds, which must be procured from the Countries where they naturally grow, for there are none of these Plants which produce Seeds here. Those Sorts, which have been brought from *North America*, sometimes produce Flowers in *England*, but the Summers here are neither warm enough, nor of a proper Duration to ripen their Seeds, so that these are propagated by parting their Roots, for when the Roots have obtained Strength, they spread very far in the Ground, and send up Stalks at a Distance from the old Roots, whereby they may be greatly increased, when the Sorts are once obtained. The best Time for transplanting and parting their Roots is early in Autumn, that the Offsets or young Plants may have Time to get good Roots before the Frost comes on, and if, after they are planted, the Cold should come on earlier, or be more severe than ordinary, if the Surface of the Ground about their Roots is covered with some old Tanners Bark or Mulch to keep the Frost out of the Ground, it will preserve them, but these Roots should not be parted oftener than every 3d or 4th Year, for unless the Roots are large, there will be few Stalks to each, and therefore will make but little Appearance.

The tender Sorts must be kept in Pots, and plunged into the Tan Bed of the Bark Stove, in order to have them strong, for although they will live in a moderate Warmth in Winter, they will make but little Progress, and their Stalks will be short, their Leaves small, and the Plants weak, so will make but a poor Appearance; therefore, unless they can be allowed Room in the warm Stove, and constantly kept in the Tan Bed, they will not be worth preserving.

As all the Sorts grow naturally under Hedges, and in Woods, they should be disposed in such a Manner, as to imitate their places of Growth, and not place them in the open Sun, where they will not thrive; therefore the hardy Kinds should be planted under the Shade of Trees, and the tender ones placed between Pots which contain tall Plants whose Branches may

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screen them from the Sun. These Plants must be frequently watered in hot Weather, and should then have a large Share of Air admitted to them, but in Winter they must be watered sparingly, for their Roots are apt to rot with too much Wet.

When the Seeds of these Plants are obtained from Abroad, they should be sown in Pots filled with fresh light Earth, and plunged into a moderate hot Bed, observing to water the Earth frequently to keep it moist, because the Seeds, being hard, will not vegetate without a considerable Share of Moisture; these generally remain in the Ground a whole Year before they grow, so that if the Plants do not come up the first Season, the Pots should be kept clean from Weeds all the Summer, and in Winter the hardy Sorts should be sheltered from Frost under a common Frame, and the tender ones plunged into the Bark Bed in the Stove: The following Spring they must be again plunged into the hot Bed, which will bring the Plants up very soon. When the Plants are come up, they must be constantly kept clear from Weeds, and frequently watered in warm Weather, and toward the End of May the hardy Sorts should be inured to the open Air by Degrees, and in June they may be removed out of the Bed, and placed abroad in a sheltered Situation, where they should remain till the Frost comes on in Autumn, when they must be removed into Shelter. If the Pots are plunged into an old Tan Bed under a Frame, where they may be protected from the Frost, and in mild Weather be exposed to the open Air, they will thrive much better than with more tender Treatment.

The tender Sorts should be plunged between the other Pots in the Bark Bed of the Stove, where they should remain all the Winter. These Plants should remain untransplanted in the Seed Pots till the following Spring, when they should be turned out of the Pots, carefully separated, and planted in Pots filled with fresh Earth, and if the hardy Sorts are plunged into a very temperate hot Bed, it will cause them to take new Root very soon, and greatly strengthen the Plants, but the tender Sorts should be plunged into a good hot Bed of Tanners Bark to bring the Plants forward, that they may get Strength before Winter, when they must be treated in the Manner before directed.

The hardy Sorts should be kept in Pots for 2 or 3 Years, that they may be sheltered in Winter, by which Time they will have Strength enough to bear the Cold in the open Air, so in the Spring they may be turned out of the Pots, and planted where they are designed to remain, observing, if the Spring should prove dry, to refresh them now and then with Water, as also to lay some Mulch about them to prevent the Earth from drying, and while the Plants are young, if some Mulch is laid about their Roots in Winter, it will be a sure Method to preserve them.

SMYRNIUM. *Tourn. Inst. R. H.* 315. *Tab.* 168. *Lin. Gen. Pl.* 325: Alexanders, or Alifanders; in *French*, *Maceron*.

The Characters are,

It has an umbellated Flower; the principal Umbel is unequal, the small ones are erect; they have no Involucreum, and the Empalement of the Flowers are scarce discernible

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cernible. The Flowers have 5 Spear-shaped Petals a little inflexed, and 5 Stamina the Length of the Petals, terminated by single Summits. The Germen is situated under the Flower, supporting 2 Styles, crowned by beaded Stigmas. The Germen turns to an almost globular Fruit which is streaked and splits in two, each containing 1 Moon-shaped Seed, convex on one Side, marked with 3 Streaks and plain on the other.

The Species are,

1. SMYRNIUM foliis caulinis ternatis petiolatis serratis. Hort. Cliff. 105. Smyrniun with trifoliate Leaves on the Stalks, which are sawed and have Foot Stalks. Hippofelinum Theophrasti five smyrniun Dioscoridis. C. B. P. 154. Common Alexanders, or Alifanders.

2. SMYRNIUM foliis caulinis orbiculatis integerrimis amplexicaulibus. Smyrniun with orbicular Leaves on the Stalks which embrace them. Smyrniun peregrinum rotundo folio. C. B. P. 152. Foreign Alexanders with a round entire Leaf.

3. SMYRNIUM foliis caulinis cordato-ovatis dentatis amplexicaulibus. Alexanders with Heart-shaped oval Leaves which are indented, embracing the Stalks. Smyrniun peregrinum folio oblongo. C. B. P. 154. Foreign Alexanders with an oblong Leaf.

4. SMYRNIUM foliis caulinis ternatis serratis, summis oppositis sessilibus. Alexanders with Leaves by Threes which are sawed, and those at the Top by Pairs sitting close to the Stalks. Smyrniun Creticum paludarii folio. Tourn. Cor. 22. Cretan Alexanders with a Smallage Leaf.

5. SMYRNIUM foliis caulinis duplicato ternatis integerrimis. Lin. Sp. Pl. 263. Alexanders with double trifoliate Leaves on the Stalks, which are entire.

The 1st Sort grows naturally on the Rocks by the Sea Shore in Wales, the North of England, and in Scotland. It is also found growing wild in many Places near London, but here it may be supposed to have been thrown out of Gardens; for as it was formerly cultivated in Gardens for the Table, the Seeds may have been scattered, which will grow where-ever they alight.

The lower Leaves of this Plant resemble those of Smallage, but are much larger; the Lobes are rounder, and sawed on their Edges. The Stalk rises from 3 to 4 Feet high, is furrowed, and branches into many Divisions; these are garnished with trifoliate Leaves of the Shape and Form with the lower, but smaller. The Branches are terminated by large Umbels of white Flowers which appear in June, and are succeeded by large roundish Fruit, containing 2 Moon-shaped Seeds which ripen in August, and then the Plant decays. The whole Plant has a strong warm Taste.

The 2d Sort grows naturally in Sicily and Crete; the lower Leaves of this Sort are compounded of small Leaves, which divide by Threes; their Lobes are oval and indented on their Edges; the Stalk is smooth, hollow, and rises 3 Feet high, dividing toward the Top into 2 or 3 Branches; at each Joint is placed 1 large orbicular Leaf, whose Base embraces the Stalk; these are of a yellow green Colour, and their Edges entire; the Branches are terminated by small Umbels of yellowish Flowers, whose smaller Umbels or Rays are of unequal Lengths. The Seeds are black and shaped like those of the former, but smaller.

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The 3d Sort grows naturally in Crete; the lower Leaves are larger than those of the former, but are composed of several winged Divisions. The Stalk does not rise so high as that of the last mentioned, but is angular and not so hollow; the Leaves on the Stalks are much larger, they are of the Heart-shaped oval Kind, indented on their Edges, and embrace the Stalks with their Base; their Colour is nearly the same with the former, but of a thinner Texture. The Umbels of Flowers are smaller, as are also the Seeds.

These two Sorts have been frequently blended together by Botanists, who have supposed they were but one Species; but I have cultivated both many Years, and have not found either of them alter.

The 4th Sort grows naturally in Crete; the lower Leaves are smaller than those of the first Sort, and more like those of Smallage; the Stalk rises higher, and grows more erect than those of the first; the Leaves on the lower Part of the Stalk are large, and sawed on their Edges; they stand by Threes round the Stalk at the Joints; their Bases set close, having no Foot Stalks; the upper Part of the Stalk and Branches are garnished with Leaves of the same Form, which stand by Pairs. The Umbels of Flowers are much smaller, and the Seeds less.

All these Sorts are biennial, perishing after their Seeds are ripe; they flower in June, and their Seeds ripen in August.

The 1st of these Sorts is that ordered by the College for medicinal Use, but is seldom now prescribed; and at present is seldom cultivated in Gardens, though formerly it was greatly used in the Kitchen, before Celery was so much cultivated, which hath taken Place of Alexanders, and entirely supplanted it. The other Sorts are preserved in Botanick Gardens for Variety, but may either of them be cultivated for the Kitchen. The 2d Sort is much preferable to the first for blanching, as I have tried, and will be tenderer, and not quite so strong.

All these Plants may be propagated by sowing their Seeds on an open Spot of Ground in August, as soon as they are ripe; for if they are preserved till Spring, they often miscarry, or at least do not come up until the 2d Year; whereas those sown in Autumn, rarely fail of coming up soon after Christmas, and will make much stronger Plants than the other.

The common Sort when cultivated for the Table, should be treated in the following Manner:

In the Spring the Plants should be hoed out, so as to leave them 10 Inches or a Foot apart each Way; and, during the following Summer, they must be constantly cleared from Weeds, which, if permitted to grow among them, will draw them up slender, and render them good for little. In February following the Plants will shoot up again vigorously, at which Time the Earth must be drawn up to each Plant, to blanch them, and in three Weeks after they will be fit for Use; when they may be dug up, and the white Part preserved, which may be stewed and eaten as Celery.

SNAP-DRAGON. See Antirrhinum.

SNEEZ-WORT. See Achillea.

SNOW is defined to be a Meteor formed in the middle Region of the Air, of Vapour raised by the Action of the Sun, or subterraneous Fire there congealed,

its Parts conſtipated, its ſpecific Gravity increaſed, and thus returned to the Earth in the Form of little *Villi* or Flakes.

Snow is very uſeful; it fructifies the Ground; it guards Corn, or other Vegetables, from the intenſer Cold of the Air, eſpecially the cold piercing Winds.

It is ſuppoſed to abound with ſaliſic and fertile Particles; as much or more than Rain; however, it is accounted more ponderous, and by that Means ſinks deeper into the Ground than Rain does, and therefore is in ſome Caſes of more Benefit to planting; for which Reaſon, ſome lay Heaps of Snow round the Feet of their Foreſt Trees, eſpecially in hot burning Lands.

Monſ. *Le Clerc* ſays, that ſome Parts of a Cloud which ſhould turn into Rain, are ſometimes prevented by the Cold, and formed into a Conſiſtence which we call Snow; which appears to be formed of watery Particles, from hence, that when it diſſolves, it turns into Water; ſo that we may eaſily conceive Snow to be made of watery Particles, hardened by Cold and gathered into Flakes, in ſuch a Manner as to leave large Interſtices between one another; which Snow is not tranſparent, as the Water, becauſe its more rigid Particles being huddled together by Chance, don't leave ſtrait Pores between one another, and ſo keep out the Matter of Light.

But when it happens, that the Region of the Air under the Cloud is very cold, the Drops of Rain are congealed as they fall, and come down in Lumps, which are called Hail; and theſe Lumps are greater or leſs, according to the Bigneſs of the Rain Drops of which they are formed, and theſe Lumps of Hail are alſo variously figured.

Dr. *Græco* in a Diſcourſe of the Nature of Snow, obſerves, that many Parts thereof are of a regular Figure, for the moſt part, being, as it were, ſo many little Rowels or Stars of perfect and tranſparent Ice; upon each of which Points are ſet other collateral Points, at the ſame Angles as the main Points themſelves; amongſt theſe are divers other irregular, which are chiefly broken Points and Fragments of the regular ones; others alſo by various Winds, ſeem to have been thawed, and frozen again into irregular Cluſters, ſo that it ſeems as if the whole Body of Snow were one entire Maſs of Icicles irregularly figured; that is, a Cloud of Vapours being gathered into Drops, the ſaid Drops do forthwith deſcend; and in their Deſcent meeting with a freezing Air as they paſs through a colder Region, each Drop is immediately frozen into an Icicle, ſhooting itſelf forth into ſeveral Points; but ſtill continuing to deſcend, and meeting with ſome intermitting Gales of warmer Air, or by their being continually waſted to and fro, touching upon one another, ſome are a little thawed, blunted, and again frozen into Cluſters, or entangled, ſo as to fall again into what we call Flakes; although Snow is firm Ice, and the Lightneſs of it is owing to the Exceſs of its Surface, in Compariſon to the Matter contained in it; as Gold itſelf may be extended in Surface, till it will ride upon the leaſt Breath of Air.

SNOWDROP. See *Galanthus*.

SOIL. See *Earth*.

SOLANOIDES. See *Piercea*.

SOLANUM. *Tourn. Inſt. R. H. 148. Tab. 62. Lin. Gen. Pl. 224. Nightshade; in French, Morelle.*

The Characters are,

The Emplacement of the Flower is permanent, of 1 Leaf, cut half through into 5 acute Segments. The Flower has 1 Wheel-shaped Petal, having a very ſhort Tube; the Brim is large, ſpreading, and five-pointed. It has 5 ſmall Awl-shaped Stamina, terminated by oblong Summits which ſtand together, and a roundiſh Germen ſupporting a ſlender Style longer than the Stamina, crowned by an obtuſe Stigma. The Germen turns to a roundiſh Berry with 2 Cells, having a convex fleſhy Receptacle, filled with roundiſh compressed Seeds.

The Species are,

1. SOLANUM caule inermi herbaceo, foliis ovatis acuminatis glabris, umbellis nutantibus. Nightshade with an herbaceous unarmed Stalk, ſmooth, oval-pointed Leaves, and nodding Umbels. *Solanum officinarum*, acinis nigricantibus. C. B. P. 166. Common Nightshade of the Shops, with black Fruit.

2. SOLANUM caule inermi herbaceo tomentoso, foliis ovatis dentato-angulatis, umbellis nutantibus. Nightshade with a woolly, herbaceous unarmed Stalk, oval, angular, indented Leaves, and nodding Umbels. *Solanum officinarum*, acinis puniceis. C. B. P. 166. Nightshade with red Fruit.

3. SOLANUM caule inermi herbaceo, foliis ovato-lanceolatis acuminatis tomentosis, umbellis nutantibus. Nightshade with an herbaceous unarmed Stalk, oval, Spear-shaped, acute-pointed, indented, woolly Leaves, and nodding Umbels. *Solanum officinarum*, acinis luteis. C. B. P. 166. Nightshade with yellow Berries.

4. SOLANUM caule inermi herbaceo glabro, foliis oblongo-ovatis acuminatis dentatis glabris, umbellis nutantibus. Nightshade with an herbaceous, unarmed, ſmooth, Stalk, oblong, oval, acute-pointed, indented, ſmooth Leaves, and nodding Umbels. *Solanum Americanum*, vulgari ſimile, acinis rubris. *Rand. American* Nightshade like the common Sort with red Berries.

5. SOLANUM caule inermi herbaceo, foliis ovatis acuminatis glabris, umbellis erectis. Nightshade with an herbaceous unarmed Stalk, oval, acute-pointed, ſmooth Leaves, and erect Umbels. *Solanum Americanum*, vulgari ſimile, flore parvo purpureſcente, acinis nigricantibus minoribus. *Rand. American* Nightshade like the common Sort, with a ſmall purpliſh Flower, and ſmaller black Berries.

6. SOLANUM caule herbaceo ſubaculeato, foliis ovatis obtuſis integerrimis, petiolis longiſſimis, umbellis nutantibus. Nightshade with an herbaceous Stalk a little prickly, oval, obtuſe, entire Leaves on very long Foot Stalks, and nodding Umbels. *Solanum nigrum vulgari ſimile*, caulibus exaſperatis. *Hort. Elſb. 368.* Black Nightshade like the common Sort, with rough Stalks.

7. SOLANUM caule inermi herbaceo, foliis oblongo-ovatis acuminatis glabris ſubdentatis, umbellis nutantibus. Nightshade with an herbaceous unarmed Stalk, oblong, oval, acute-pointed, ſmooth Leaves a little indented, and nodding Umbels. *Solanum Guineenſe*, fructu magno inſtar ceraſi nigerrimo umbellato. *Boerb. Ind. alt. 2. p. 68.* Nightshade from Guinea; with a large Fruit like black Cherries, in Umbels.

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8. *SOLANUM caule inermi frutescente flexuoso, foliis superioribus hastatis, racemis cymosis.* Hort. Cliff. 60. Nightshade with a shrubby, bended, unarmed Stalk, the upper Leaves Spear-shaped, and Bunches of Flowers at the Top of the Stalk. *Solanum scandens, seu dulcamara.* C. B. P. 166. Perennial climbing Nightshade, commonly called Bitter-sweet.

9. *SOLANUM caule inermi fruticoso, foliis lanceolatis repandis, umbellis sessilibus.* Lin. Sp. Pl. 184. Nightshade with a shrubby unarmed Stalk, Spear-shaped Leaves turning inward, and the Umbels fitting close to the Stalks. *Solanum fruticosum bacciferum.* C. B. P. 167. Shrubby Berry-bearing Nightshade commonly called Anomum Plinii.

10. *SOLANUM caule aculeato fruticoso, foliis lanceolatis anguloso-dentatis.* Hort. Cliff. 61. Nightshade with a shrubby prickly Stalk, and Spear-shaped Leaves angularly indented. *Solanum spiniferum frutescens, spinis igneis, Americanum.* Pluk. Phyt. Tab. 225. fig. 5. Shrubby and thorny American Nightshade, with Fire-coloured Thorns.

11. *SOLANUM caule aculeato fruticoso, foliis ovatis dentato-angulatis utrinque tomentosis, pedunculis spinosis.* Nightshade with a shrubby prickly Stalk, oval, angular, indented Leaves, woolly on every Side, and prickly Foot Stalks to the Flowers. *Solanum spinosum, maxime tomentosum.* Bocc. Rar. Plant. Thorny Nightshade, very much covered with a Wool or Down.

12. *SOLANUM caule aculeato fruticoso, foliis pinnato-lacinatis obtusis utrinque aculeatis.* Nightshade with a shrubby prickly Stalk, Wing-cut Leaves which are obtuse, and have Spines on both Sides. *Solanum pomiferum frutescens Africanum spinosum nigricans, flore boraginis, foliis profunde lacinatis.* H. L. Shrubby African Apple-bearing Nightshade with black Thorns, a Flower like Borage, and deeply jagged Leaves, commonly called Pomum Amoris.

13. *SOLANUM caule aculeis recurvis, foliis sinuatis subtus tomentosis utrinque aculeatis, pedunculis aculeatis.* Lin. Flor. Zeyl. 95. Nightshade with recurved Thorns on the Stalks, and sinuated Leaves downey on their under Side, armed with Prickles on both Sides, and the Foot Stalks of the Flowers are prickly.

14. *SOLANUM caule aculeato fruticoso, foliis anguloso-dentatis tomentosis, floribus in racemis lateralibus.* Nightshade with a shrubby prickly Stalk, angular, indented, woolly Leaves, and the Flowers in long Bunches at the Wings of the Stalk. *Solanum indicum spinosum boraginis flore.* Icon. Robert. H. R. Prickly Indian Nightshade with a Flower like Borage.

15. *SOLANUM caule aculeato herbaceo, foliis sinuatis glabris, utrinque aculeatis, umbellis erectis, calycibus æbinatis.* Nightshade with a prickly herbaceous Stalk, smooth sinuated Leaves armed with Spines on both Sides, upright Umbels, and very prickly Empalements. *Solanum Americanum spinosum herbaceum, acanthi folio, flore amplo cæruleo.* Houst. Mss. Prickly herbaceous American Nightshade with a Bearbreech Leaf, and a large blue Flower.

16. *SOLANUM caule aculeato fruticoso, foliis pinnato-lacinatis tomentosis, utrinque aculeatis, pedunculis axillaribus bifloris.* Nightshade with a prickly shrubby Stalk, Wing-cut Leaves which are woolly, and prickly on

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both Sides, and Foot Stalks with two Flowers at the Wings of the Stalk. *Solanum Americanum spinosissimum herbaceum, anguria folio, flore luteo.* Houst. The most prickly American Nightshade with a Water Melon Leaf, and a yellow Flower.

17. *SOLANUM caule aculeato fruticoso, foliis oblongis sinuato-pinnatis, aculeatis, umbellis sessilibus.* Nightshade with a prickly shrubby Stalk, oblong, Wing-sinuated, prickly Leaves, and Umbels fitting close to the Stalks. *Solanum Americanum frutescens, & spinosum, quercus folio, baccis rubris.* Houst. Mss. Shrubby prickly American Nightshade with an Oak Leaf, and red Berries.

18. *SOLANUM caule aculeato fruticoso, foliis ovatis tomentosis, anguloso-sinuatis subaculeatis, umbellis sessilibus.* Nightshade with a prickly shrubby Stalk, oval, woolly, angular, sinuated Leaves a little prickly, and Umbels fitting close to the Stalks. *Solanum Americanum bacciferum, caule & foliis tomentosis incanis spinosis, flore luteo, fructu croceo.* Sloan. Cat. 108. Berry-bearing American Nightshade with hoary Stalks and Leaves, a yellow Flower, and Saffron-coloured Fruit.

19. *SOLANUM caule aculeato fruticoso, foliis lanceolatis subdentatis glabris, racemis longioribus exillaribus.* Nightshade with a prickly shrubby Stalk, smooth Spear-shaped Leaves a little indented, and longer Bunches of Flowers from the Wings of the Stalk. *Solanum Americanum fruticosum bacciferum spinosum, flore cæruleo.* Sloan. 108. Shrubby Berry-bearing American Nightshade with a blue Flower.

20. *SOLANUM caule aculeato fruticoso, foliis ovato-oblongis acuminatis tomentosis, umbellis erectis axillaribus.* Nightshade with a shrubby Stalk armed with a few Spines, oval, oblong, woolly Leaves, and erect Umbels from the Wings of the Stalk. *Solanum Americanum frutescens & spinosum, flore magno albo.* Houst. Mss. Prickly and shrubby American Nightshade with a large white Flower.

21. *SOLANUM caule inermi frutescente flexuoso, foliis ovatis subtus tomentosis, floribus solitariis alaribus.* Nightshade with a shrubby, bending, unarmed Stalk, oval Leaves woolly on their under Side, and Flowers growing singly from the Wings of the Stalk. *Solanum Americanum, scandens & frutescens, flore magno cæruleo, fructu rubro.* Houst. Mss. Shrubby climbing American Nightshade with a large blue Flower, and a red Fruit.

22. *SOLANUM caule inermi fruticoso, foliis ovatis acuminatis integerrimis, subtus tomentosis, umbellis erectis alaribus & terminalibus.* Nightshade with a shrubby unarmed Stalk, oval, acute-pointed entire Leaves, woolly on their under Side, and erect Umbels from the Wings and Top of the Branches. *Solanum Americanum frutescens, non spinosum, lauri folio, flore racemoso cæruleo.* Houst. Mss. Smooth shrubby American Nightshade with a Bay Leaf, and blue Flowers growing in Clusters.

23. *SOLANUM caule aculeato fruticoso, foliis ovatis sinuato-dentatis subtus tomentosis, aculeis utrinque rectis, umbellis sessilibus terminalibus.* Nightshade with a prickly shrubby Stalk, oval, sinuated, indented Leaves woolly on their under Side, the Spines every Way straight, and Umbels fitting close at the End of the Branches. *Solanum Americanum frutescens & spinosum, foliis inra tomentosis, flore magno cæruleo.* Houst. Mss. Shrubby

and

and prickly American Nightshade with Leaves which are hoary underneath, and a large blue Flower.

24. *SOLANUM caule inermi fruticoso, foliis ovato lanceolatis integerrimis subtus tomentosis, umbellis erectis pedunculis longissimis.* Nightshade with a shrubby unarmed Stalk, oval, Spear-shaped, entire Leaves woolly on their under Side, and erect Umbels having very long Foot Stalks. *Solanum Americanum arborescens, verbasco folio, fructu flavesciente majori.* Plum. Cat. 4. Tree-like American Nightshade with a Mullein Leaf, and a larger yellow Fruit.

25. *SOLANUM caule frutescente subinermi, foliis cuneiformibus sinuato-repandis.* Lin. Sp. Pl. 185. Nightshade with a shrubby almost unarmed Stalk, and Wedge-shaped Leaves which are sinuated, and turn backward. *Solanum Bonariense arborescens, papas floribus.* Hort. Elth. 364. Tree-like Nightshade of Buenos Ayres with Flowers like the Potatoe.

26. *SOLANUM caule frutescente inermi, foliis lanceolatis sinuato dentatis glabris, umbellis erectis.* Nightshade with a shrubby unarmed Stalk, Spear-shaped, sinuated, indented, smooth Leaves, and erect Umbels. *Solanum Babamense arborescens, folio sinuato.* Hort. Elth. 363. Tree-like Nightshade from the Babama Islands with a sinuated Leaf.

27. *SOLANUM caule inermi fruticoso foliis ovatis integerrimis pedunculis lateralibus filiformibus.* Lin. Sp. Pl. 185. Nightshade with a shrubby unarmed Stalk, oval entire Leaves, and Thread-like Foot Stalks to the Flowers, proceeding from the Side of the Branches. *Solanum lignosum Africanum sempervirens, laurinis foliis.* H. Amst. 2. p. 191. Woody ever-green African Nightshade with Bay Leaves.

28. *SOLANUM caule inermi frutescente flexuoso, foliis ovatis subdentatis crassis.* Nightshade with a shrubby, flexible, unarmed Stalk, and oval thick Leaves somewhat indented. *Solanum dulcamarum Africanum, foliis crassis birsutis.* Hort. Elth. 365. Climbing African Nightshade with hairy thick Leaves.

29. *SOLANUM caule frutescente inermi, foliis lanceolatis integerrimis subtus pilosis, umbellis erectis terminalibus.* Nightshade with a shrubby unarmed Stalk, Spear-shaped entire Leaves hairy on their under Side, and erect Umbels terminating the Branches. *Solanum Americanum frutescens non spinosum foliis oblongis subtus incanis, floribus umbellatis.* Houst. Mss. American shrubby Nightshade without Thorns, oblong Leaves hoary on their under Sides, and Flowers in Umbels.

30. *SOLANUM caule inermi fruticoso, foliis ovatis integerrimis, subtus tomentosis, umbellis erectis terminalibus, calycibus obtusis lanuginosis.* Nightshade with a shrubby unarmed Stalk, oval entire Leaves woolly on their under Side, erect Umbels terminating the Branches, and downy obtuse Empalements. *Solanum Americanum fruticosum glabrum, foliis subrotundis subtus incanis, floribus racemosis.* Houst. Mss. Smooth shrubby American Nightshade with roundish Leaves hoary on their under Side and branching Flowers.

31. *SOLANUM caule aculeato, foliis, oblongo-ovatis, dentato sinuatis, subtus pilosis, umbellis lateralibus.* Nightshade with a shrubby prickly Stalk, oblong oval Leaves with sinuated Indentures which are hairy on their under Side, and Umbels on the Side of the Branches. *Solanum*

spinosum frutescens, quercus folio latiore. Houst. Mss. Shrubby prickly Nightshade with a broader Oak Leaf.

32. *SOLANUM caule aculeato fruticoso, foliis sinuato-dentatis, racemis lateralibus, aculeis utrinque incurvis.* Nightshade with a prickly shrubby Stalk, Leaves with sinuated Indentures, Bunches of Flowers on the Side of the Branches, and the Spines every where recurved. *Solanum spinosum, Jamaicense glabrum, foliis parvis minus profunde laciniatis.* Pluk. Phyt. Tab. 316. fig. 5. Prickly Jamaica Nightshade whose small Leaves are less deeply cut.

33. *SOLANUM caule aculeato fruticoso, foliis sinuatis obtusis, utrinque tomentosis, floribus racemosis terminalibus.* Nightshade with a shrubby prickly Stalk, obtuse sinuated Leaves woolly on both Sides, and Flowers in loose Bunches terminating the Branches.

34. *SOLANUM caule aculeato herbaceo, foliis laciniatis dentatis tomentosis, utrinque aculeatis, calycibus tomentosis.* Nightshade with a prickly herbaceous Stalk, cut Leaves indented, woolly, and armed with Spines on both Sides, and woolly Empalements. *Solanum annuum nigricans Virginianum spinosissimum late se spargens, flore caeruleo glabrum.* Pluk. Phyt. Tab. 62. fig. 3. Black annual Virginia Nightshade which is the most prickly, having a blue smooth Flower.

35. *SOLANUM caule aculeato herbaceo, foliis cordatis quinquelobis, utrinque villosis aculeatis.* Vir. Cliff. 15. Nightshade with a prickly herbaceous Stalk, and Heart-shaped Leaves with 5 Lobes which are hairy, and prickly on both Sides. *Solanum Barbadosense spinosum annuum, fructu aureo rotundiore pyri parvi inversi forma & magnitudine.* Pluk. Phyt. Tab. 225. fig. 1. Annual prickly Barbadoes Nightshade with a rounder golden Fruit of the Form and Size of a small Pear inverted, commonly called Bachelors Pear.

36. *SOLANUM caule herbaceo erecto inermi, foliis ovato lanceolatis anguloso-dentatis floribus lateralibus.* Nightshade with an herbaceous erect unarmed Stalk, oval Spear-shaped Leaves angularly indented, and Flowers on the Side of the Stalks.

The 1st Sort is now very common on Dunghills, and rich cultivated Soils, in many Parts of England; where it often becomes a very troublesome Weed. This is the Sort which the College of Physicians have directed to be used in Medicine, under the Title of *Solanum bortense*: And although it is now become a very troublesome Weed in many Gardens near London, yet it is not a Native of this Country, but is supposed to have been brought originally from America, from whence the greater Part of the Species of this Genus have been introduced into Europe.

There are two Varieties of this found growing naturally in England. The most common Sort is an upright branching Plant with oval acute-pointed smooth Leaves, and black Berries. The other is a low branching Plant with indented Leaves, and greenish yellow Berries, but whether these are only Varieties, or distinct Species I cannot say, though I have sown their Seeds separately, and have found them keep their Difference one Year, but do not know if they will continue it always.

The 2d Sort rises with an erect branching Stalk 3 Feet high, the Leaves are oval, angular, indented, and smooth, the Flowers are produced in roundish Bunches,

in Form of Umbels; they are white, having 5 Star-pointed Petals which spread open and are reflexed; in the Center are 5 Stamina, terminated by oblong yellow Summits standing close together; after the Flowers are past, the Germen will swell to round pulpy Berries of a deep red Colour, standing in nodding Umbels on the Side of the Branches; the Flowers appear in *July*, and the Seeds ripen in Autumn. I have several Times received the Seeds of this Sort from *Barbadoes*, where it is supposed to grow naturally.

The 3d Sort rises with hairy branching Stalks 2 Feet and a Half high, the Leaves are woolly, oval, Spear-shaped, acute-pointed, and indented on their Edges, the Flowers are like those of the former Sort, and the Berries are of the same Size and Shape, but of a dirty yellow Colour; this flowers and ripens its Berries at the same Time with the former. The Seeds of this came from *America*. The Seeds of the 4th Sort came from the *West-Indies*; this hath taller and smother Stalks than either of the former; the Leaves are of a dark green and smooth, they are oval, acute-pointed, and indented on their Edges in angular Indentures, the Flowers are produced in nodding Umbels on the Side of the Branches, which are succeeded by smooth red Berries; this flowers at the same Time with the former Sorts.

The 5th Sort grows naturally in *Virginia*, the Stalks are angular, and rise upward of 3 Feet high, dividing into a few slender Branches, which spread from each other, and are garnished with oval acute-pointed smooth Leaves, of a deep green Colour; they have a few Indentures on their Edges; the Flowers are very small, and there are but few in each Umbel; they have narrow acute-pointed Petals, white on the Inside, and purplish without; they appear in *August*, and are succeeded by small black Berries, which ripen late in Autumn.

The 6th Sort grows naturally in *North America*. The Stalks of this Sort rise 3 Feet high, and divide into spreading Branches, they are angular, furrowed, and have a few short Spines; the Leaves are oval and entire; they are 6 Inches long, and 5 broad, of a dark green Colour, and have long Foot Stalks; the Flowers come out from the Side of the Branches, in small Umbels, which nod on one Side; they are small, white, and Star-pointed, and are succeeded by small black Berries, which ripen late in the Autumn.

The 7th Sort grows naturally in *Guinea*. This rises with a strong, thick, herbaceous Stalk, 2 Feet and a Half high, dividing into short thick Branches, garnished with oblong, oval, smooth Leaves, near 5 Inches long, and 3 and a Half broad, which have a few Indentures, and stand on pretty long Foot Stalks. The Flowers are produced in nodding Umbels from the Side of the Stalk, they are like those of the first Sort, but larger. These are succeeded by large black Berries, the Size of the common black Cherry, which ripens in Autumn.

These 7 Sorts are annual, so their Seeds should be sown in the Spring, on a Bed of rich Earth where the Plants are designed to remain, and when they come up, they must be thinned, leaving them at least 2 Feet Distance, that they may have Room to grow, after this they will require no farther Care, but to keep them clean from Weeds; in *July* and *August* they will flower, and the Seeds will ripen in Autumn. Some People

plant 1 or 2 Plants of each Sorts in Pots, whose Stalks they train up to Sticks, to make them strait; and in Autumn they remove the Pots into the Green-house, where they may be preserved till the Spring, and during the Winter, their Fruit being ripe, will make a pretty Appearance.

The 8th Sort is a climbing woody Plant, which grows in the Hedges in divers Parts of *England*, and is by some planted in Gardens, to cover Arbours, or shady Walls, in *London*, and other close Places, where few other Plants will thrive. The Cuttings or Stalks of this are put into Glasses of Water, and placed in Rooms, where they will put out Branches and Leaves, and continue a long Time green. This Plant is also used in Medicine, for some particular Preparations; but the Herb Folks in the Markets often sell this instead of the Garden Nightshade, which is a cooling Plant, and this is a hot acrid one, which renders it contrary to the Intention of the Ointment, wherein Nightshade is one of the Ingredients.

There is a Sort of this with white Flowers, supposed to be a Variety of the former, but the Leaves are woolly, in which it differs from the other, and this is constant. There is also one with variegated Leaves, preserved by those who are very curious in collecting the various Kinds of striped leaved Plants.

These may be easily propagated by laying down their Branches, or by planting their Cuttings in the Spring on a moist Soil, where they will soon take Root, and may afterward be transplanted where they are to remain.

The 9th Sort grows naturally at the *Madeiras*; this rises with a strong woody Stalk 4 or 5 Feet high, and divides into many slender stiff Branches, garnished with Spear-shaped Leaves turning backward; The Flowers grow in small Umbels, or singly on the Side of the Branches, to which they sit close, these are white, with yellow Summits, and appear in *June*, *July*, and *August*, and are succeeded by Berries as large as small Cherries, which ripen in Winter, when they make a good Appearance in the Green-house. There are two Varieties of this, one with a red, and the other has a yellowish Fruit.

This Plant may be propagated by sowing its Seeds in a Pot of rich Earth in the Spring, placing it upon a moderate hot Bed, which will greatly facilitate their Growth; the Earth in the Pot should be frequently watered, for if it is kept too dry the Seeds will not grow. When the Plants are come up, you should make a gentle hot Bed, which must be covered with rich Earth about 6 Inches thick; in this they should be planted about 6 Inches Distance each Way, and the Bed arched over with Hoops, &c. and covered with Mats, to shade them from the Sun and Cold; observing frequently to water them.

When the Plants have acquired Strength, and the Season becomes favourable, you must inure them to bear the open Air by degrees, to which they should be fully exposed in *June*, when also they should be taken up, with a Ball of Earth to the Root of each Plant, and placed separately in Pots filled with rich Earth, which must be set in a shady Situation, and frequently watered until they have taken new Root; after which they may

be removed into a more open Exposure and placed among other exotic Plants; but they require a great Plenty of Water in dry Weather, without which they seldom produce much Fruit.

In Winter they must be removed into the Green-house, and placed in the coldest Part of the House, where they may have as much free Air as possible in mild Weather; being so hardy, as many Times to endure the Cold of our ordinary Winters abroad, when planted in a warm Situation; so that they only require to be sheltered from severe Frost.

These Plants should be annually shifted about the latter End of *April*, when their Roots should be pared round, cutting off all the mouldy Fibres which were next the Pot, and the Pots filled up with fresh rich Earth, which will strengthen their Flowers, and cause them to produce Plenty of Fruit; which, (as I said before) ripens in Winter, and being of the Shape and Size of Cherries, are commonly called Winter-Cherries by the Gardeners.

The 10th Sort grows naturally in the *West-Indies*; this rises with a shrubby Stalk 3 Feet high, dividing at the Top into several Branches, closely armed with strait gold-coloured Spines on every Side. The Leaves are from 2 to 3 Inches long, and three Quarters of an Inch broad, having a few angular Indentures, and their Mid-rib is armed with a Row of the like Spines as those upon the Stalks, which stand erect. The Flowers are produced in long Bunches from the Side of the Stalks, they are white, and of the same Size of those of the ninth, which are succeeded by red Berries almost as large as the small black Cherry.

The 10th Sort is much tenderer than either of the former, being brought from the warm Parts of *America*. This is propagated by sowing their Seeds in the Spring, on a good hot Bed, and when the Plants are come up, they should be each transplanted into a separate small Pot filled with rich Earth, and plunged into a fresh hot Bed again, observing to water and shade them until they have taken Root, after which they should have Air and Water in Proportion to the Heat of the Season, and the Bed in which they are placed, and when their Roots have filled the Pots in which they were planted (which they will do in two Months time, if they thrive,) they must be shaken out, and after having gently pared off the Fibres which grew next the Pot, they should be placed into Pots a Size larger, which must be filled with fresh rich Earth, and plunged into a fresh hot Bed, to bring the Plants forward, observing to water them frequently; for they will not thrive without Plenty of Moisture in warm Weather.

In *July* these Plants may be inured to bear the open Air by Degrees, into which they may be removed, if the Season be warm; but otherwise they must always be preserved either under Glasses, or in the Stove, and if they are placed in the open Air, they should not remain there longer than the Middle or latter End of *August*, lest the Nights growing cold, should hurt them. During the Winter Season they must be preserved in the Stove, observing to refresh them frequently with Water, but they must not have too much each Time, especially in cold Weather. The 2d Year they will produce Flowers and Fruit.

The 11th Sort has a shrubby Stalk, which rises 2 Feet high, and divides into several woody Branches armed with sharp Thorns, and garnished with oval, woolly Leaves which have angular Indentures on their Edges, they are an Inch and a Half long, and more than an Inch broad. The Flowers are produced in small loose Bunches from the Wings of the Stalks; they are blue, and larger than those of the former Sorts; these appear in *June* and *July*, and are succeeded by round Berries as large as common Cherries, of a gold Colour, which turn black when ripe.

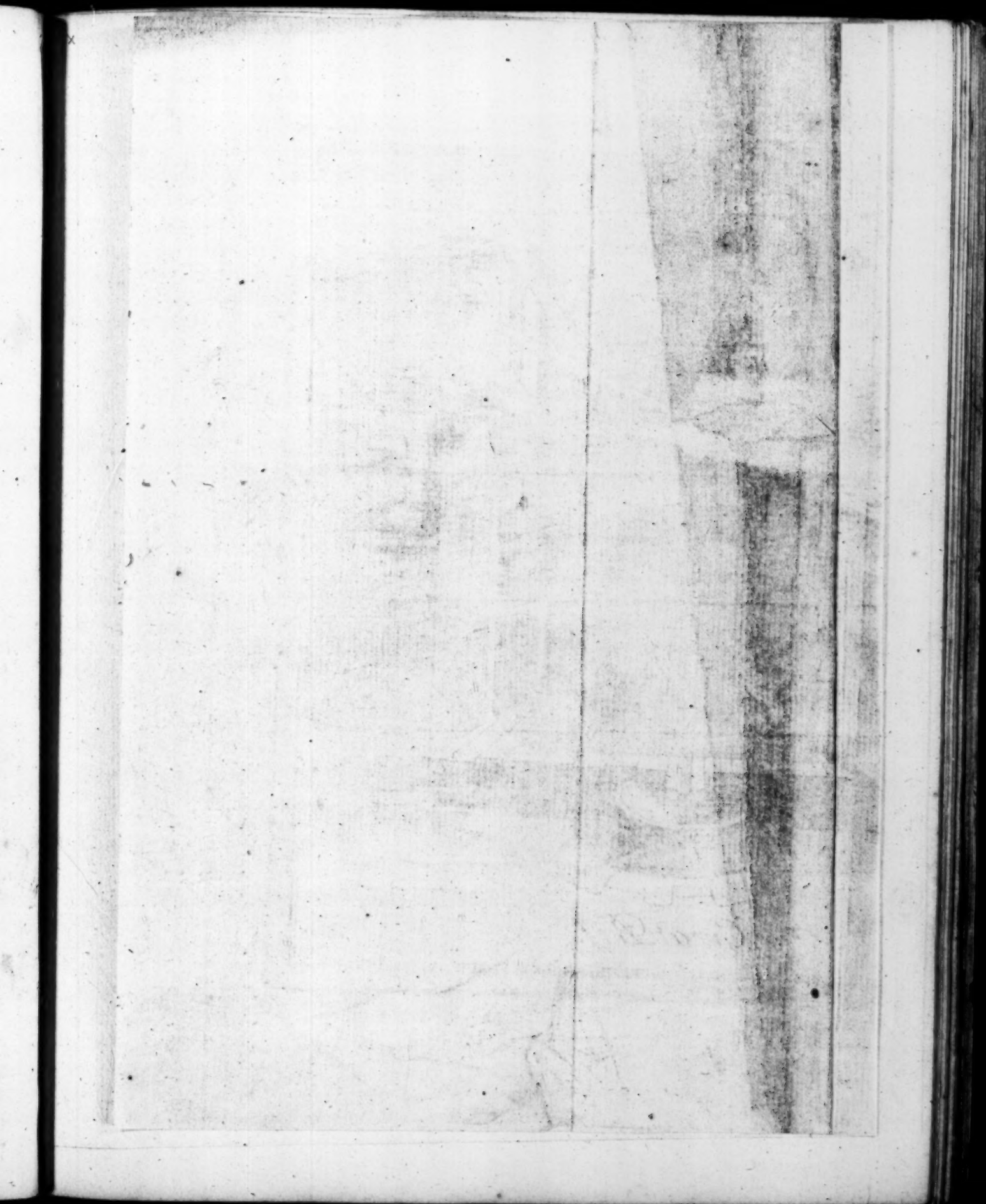
The 12th Sort grows naturally at the *Cape of Good Hope*; this hath a strong, thick, shrubby Stalk, which rises from 2 to 3 Feet high, sending out many short, thick Branches, closely armed with short strong yellow Spines on every Side; the Leaves are about 4 Inches long, and 2 broad; they are cut almost to their Mid-rib, in obtuse Segments, which are opposite, regular, and formed like winged Leaves; these Segments have several obtuse Indentures on their Edges; they are of a dark green Colour, and are armed with the same Sort of Spines, as those on the Stalks on both Sides. The Flowers come out in small Bunches on the Side of the Branches; they are blue, and larger than those of the former Sort; these appear in *June* and *July*, and are succeeded by round yellow Berries as large as Walnuts, which ripen in Winter.

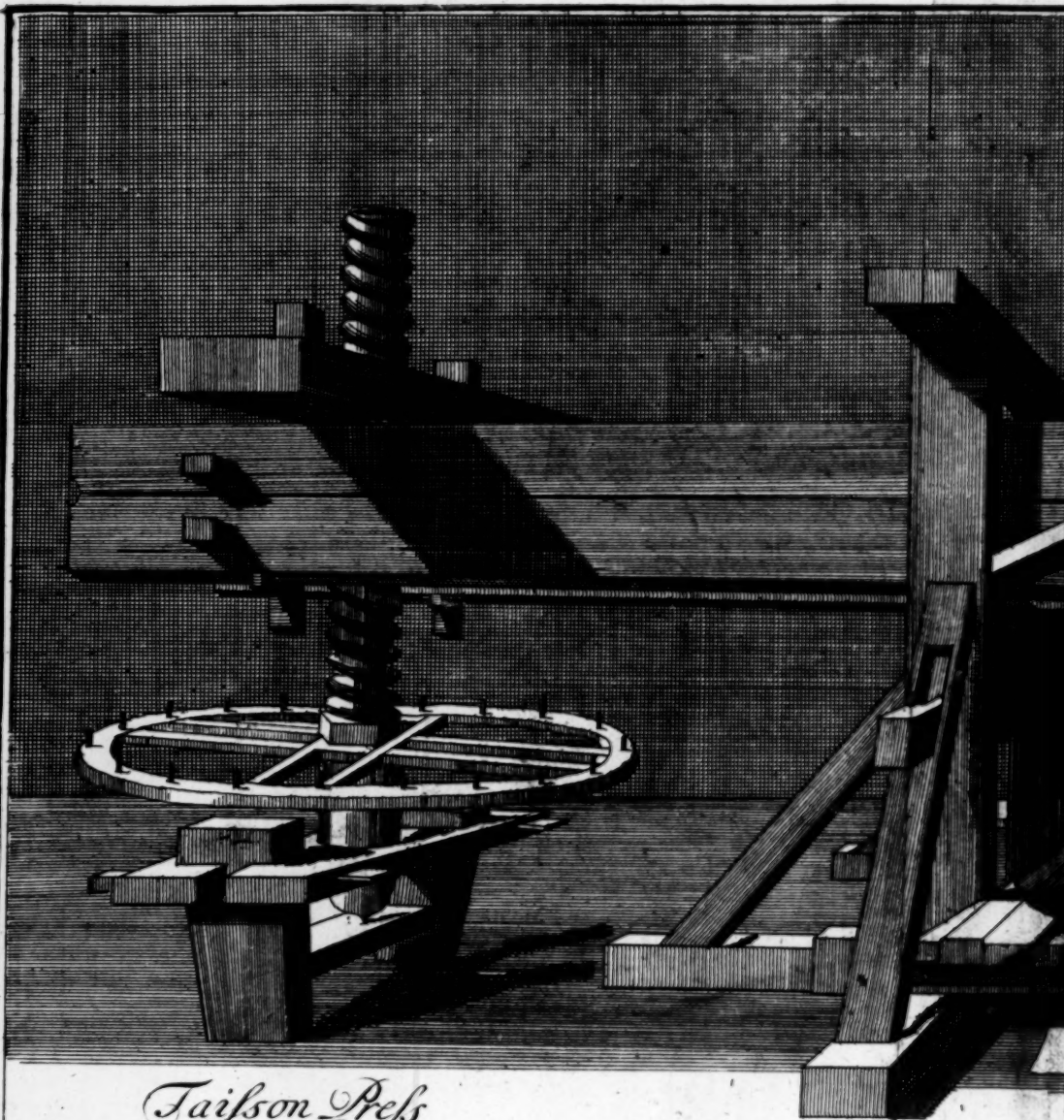
The 11th and 12th Sorts are not so tender as the last, but require an open airy Glass Case, or a warm Green-house in Winter, but in Summer may be exposed in the open Air with other exotic Plants. These may be propagated by sowing their Seeds on a hot Bed, as the former, and should be managed as hath been directed for them, with this Difference, that they may be much sooner exposed to the Air, and should not be bred so tenderly. These are preserved for their odd Appearance, by such as are curious in cultivating exotic Plants; their Fruits being ripe in Winter, afford a Variety in the Green-house, and their Leaves and Flowers being very remarkable in their Colour, Shape, &c. render them worthy of a Place in every good Collection of Plants.

The 13th Sort grows naturally at the *Cape of Good Hope*; this hath a shrubby Stalk, covered with a white mealy Down, which rises 4 or 5 Feet high, dividing into a few straggling Branches, armed with short thick dark brown Spines, having yellowish Points and are recurved. The Leaves are 3 Inches long and 2 broad; they are sinuated, of a bright green on their upper Side, but have a white woolly Underside. This Sort has not as yet produced any Flowers in *England*, though there are large Plants of it in the *Chelsea* Garden, where they were raised from Seeds, which came from the *Cape of Good Hope*.

This may be propagated by Seeds as the two former, and the Plants must be treated the same Way, but they are not so hardy as the 2 former, so should be placed in a warm Glass Case, or Green-house in Winter, and should not have much Water in cold Weather.

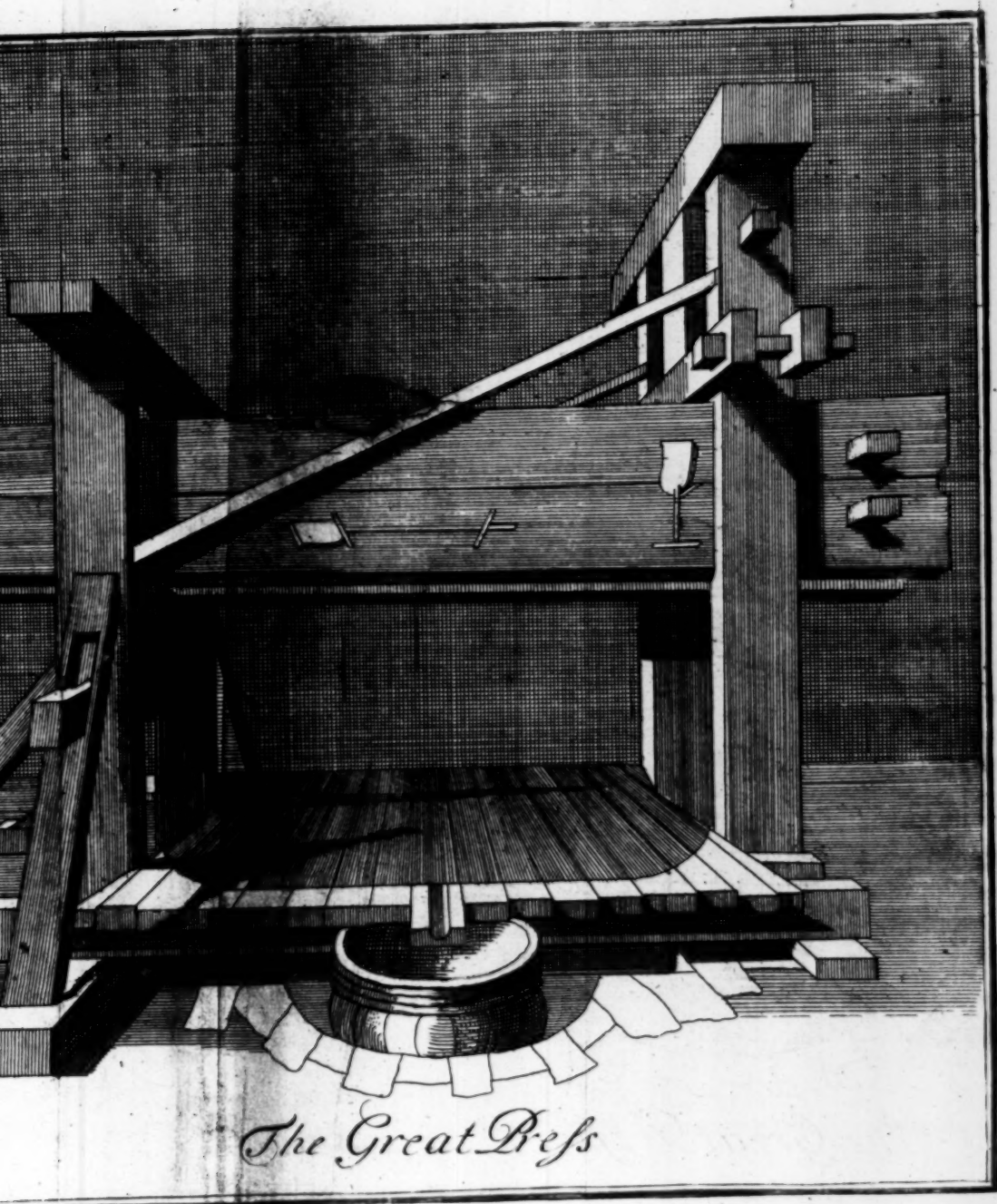
The 14th Sort has a shrubby Stalk, which rises 2 or 3 Feet high, sending out several ligneous Branches, armed with short strong yellowish Spines; the Leaves are an Inch and a Half long, and an Inch broad woolly on both Sides, and are angularly indented. These are armed





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armed with Spines on both Sides, in a Row on the Mid-rib. The Flowers come out in longish Bunches from the Side of the Stalks, they are blue, and like those of the twelfth; they appear in June and July, and are succeeded by round Berries of a gold Colour, as large as Cherries, which ripen in Winter.

The 15th Sort was discovered by Dr. Housloun, at *La Vera Cruz* in *New Spain*, from whence he sent the Seeds to *England*, which succeeded in the *Chelsea Garden*. This rises with a prickly herbaceous Stalk near 2 Feet high, dividing into 2 or 3 Branches, closely armed with slender yellow Spines of unequal Lengths. The Leaves are 6 Inches long, and 3 and a Half broad, of a bright green Colour, and deeply sinuated; the Veins of the Leaves are armed with yellow erect Spines on both Sides. The Umbels of Flowers stand erect at the End of the Branches, the Flowers are very large and of a fine blue Colour; these are succeeded by round Berries, as large as common Cherries, marbled with white and green. The Empalement of the Flower is armed with Spines like a Hedgehog. It flowers in July and August, but the Fruit ripens late in the Autumn, so that unless the Plants are brought forward in Spring, they will not produce ripe Seeds in *England*.

The 16th Sort grows naturally at *La Vera Cruz* in *New Spain*. This hath shrubby trailing Stalks 2 Feet long, armed with long yellow Spines, and covered with a gray Bark; the Leaves are near 4 Inches long, and almost 2 broad, very finely cut in Form of winged Leaves, almost to their Mid-rib; they are woolly, and armed with long, slender, yellowish Spines on their Veins on both Sides. The Foot Stalks of the Flowers arise from the Wings of the Stalks, they are 2 or 3 Inches long, each for the most part sustaining 2 large yellow Flowers, having very prickly Empalements; these are succeeded by small round Berries the Size of gray Peas, which are marbled with green and white.

The 17th Sort was discovered at *La Vera Cruz*, this rises with a shrubby Stalk, 5 or 6 Feet high, armed with short recurved Spines, and covered with a smooth brownish Bark, garnished with oblong Leaves 6 Inches long, and 2 and a Half broad, regularly sinuated on both Edges in form of winged Leaves; these rise by 2 or 3 from the same Point, and stand erect; they are armed with a few short Spines along their Mid-rib on both Sides. The Flowers come out in small loose Bunches from the Side of the Branches to which they sit close; these are but small; they have 5 white Star-pointed Petals, and are succeeded by small Berries about the Size of those of Juniper, which, when ripe, are red.

The 18th Sort grows naturally in *Jamaica*, this rises with a shrubby woolly Stalk 5 or 6 Feet high, armed with short recurved Thorns, and garnished with oval woolly Leaves 6 Inches long, and 4 broad, angularly sinuated, with a very few short crooked Spines upon the Mid-rib on the under Side. The Flowers are in small Umbels sitting close to the Side of the Branches; they are small and yellow; they are succeeded by small round Berries of a Saffron Colour when ripe.

The 19th Sort grows naturally in *Jamaica*; this rises with shrubby Stalks 3 or 4 Feet high, dividing into several irregular Branches which have a gray Bark,

and are armed on every Side with slender erect Spines of a gray Colour. The Leaves are Spear-shaped, an Inch and a Half long, and half an Inch broad; they are smooth, and a little indented or waved on their Edges. The Flowers come out in long Bunches from the Side of the Stalk, standing on long Foot Stalks: they are of a fine blue Colour, and are succeeded by Saffron-coloured Berries the Size of Peas.

The 20th Sort was discovered by the late Dr. *William Housloun* at *La Vera Cruz*; this has a strong shrubby Stalk, covered with a brown woolly Bark, which rises 4 or 5 Feet high, and is armed with a few short Spines, sending out several ligneous Branches, garnished with oblong, oval, acute-pointed Leaves, covered with a brown woolly Down on both Sides; they are 6 Inches long, and almost 3 broad in the Middle. The Flowers grow in erect Umbels from the Side of the Branches; they are large, white, and have thick woolly Empalements; these are succeeded by yellow Berries as large as middling Cherries.

The 21st Sort was discovered growing naturally at *La Vera Cruz*; this has a shrubby climbing Stalk, which rises 10 or 12 Feet high, covered with a smooth brown Bark, and divides into several Branches. The Leaves are oval, woolly on their under Side, but of a dark green on their upper; they are 2 Inches long, and one and a Half broad. The Flowers come out singly from the Wings of the Stalk; they are large, of a fine blue Colour, and the Petal is not divided into Segments like those of the other Species, but have 5 Angles, each ending in a Point; these are succeeded by round Berries about the Size of gray Peas, which are red when ripe.

The 22d Sort was discovered by Dr. *Housloun* at *Campeachy*; this rises with a smooth shrubby Stalk, 6 or 7 Feet high, sending out ligneous Branches on every Side, which have a smooth brown Bark, and are garnished with oval acute-pointed Leaves which are entire, woolly on their under Side; they are 4 Inches long, and 2 and a Half broad. The Flowers are collected into Umbels which stand erect; these come out from the Side and at the End of the Branches; they are of a light blue Colour, and are succeeded by round Berries; the Size of small black Cherries, which are yellow when ripe.

The 23d Sort was discovered at *La Vera Cruz*; this has a shrubby Stalk which rises 4 Feet high, having a white downy Bark, and armed on every Side with strait brown Spines. The Leaves stand 3 Inches asunder; they are oval, and have sinuated Indentures; they are 2 Inches long, and one and a Quarter broad, woolly on their under Side, and have prickly Foot Stalks. Their Mid-rib is armed with 2 or 3 small Spines, sometimes on both Sides, and at others but on one. The Spines are all erect; the Flowers are disposed in an Umbel sitting close at the End of the Branches; they are large, of a fine blue Colour, and have woolly Empalements; these are succeeded by round Berries, the Size of large Peas, which are red when ripe.

The 24th Sort grows naturally at *Campeachy* this rises with a woody Stalk, 8 or 10 Feet high, sending out several ligneous Branches covered with a gray Down, and furrowed. The Leaves are sometimes placed alternately

on the Branches, and at others they are opposite, standing on pretty long thick Foot Stalks; they are 7 Inches long, and 3 and a Half broad; their Edges are entire, and they end in acute Points, and are woolly on their under Side. The Flowers terminate the Branches in large erect Umbels standing on long Foot Stalks; they are large, white, and have woolly Empalements; these are succeeded by Berries, the Size of Cherries, which turn yellow.

The 12th last mentioned Sorts are propagated by Seeds as the former, but these, being Natives of a warm Country, must be raised on a hot Bed early in the Spring, and when the Plants are fit to remove, they must be each planted in a separate small Pot filled with fresh rich Earth, and plunged into a moderate hot Bed of Tanners Bark, observing to shade them from the Sun until they have taken new Root; after which Time they should have a large Share of fresh Air admitted to them in warm Weather, and must be frequently watered. Toward the latter End of June it will be proper to harden the plants gradually, and soon after they should be removed into the Stove, where they must have as much free Air as possible in warm Weather, but as the Cold approaches in Autumn, they must be carefully protected therefrom, and in Winter they should be kept in a moderate Temperature of Warmth, otherwise they will not live in this Country.

Some of these Sorts will bear to be exposed in the open Air, in the Heat of Summer, provided they are placed in a warm Situation, but if the Season should prove cold, they will not thrive abroad, wherefore it will be better to let them remain in the Stove, and open the Glasses in Front, and at the Top of the Stove, every Day, to admit as much Air as possible in hot Weather, with which Management they will thrive much better than in the open Air.

The 25th Sort grows naturally at *Buenos Ayres* in the *Spanish West-Indies*; this rises with a woody Stalk, 10 or 12 Feet high, covered with a purplish Bark, almost smooth. At the Top it divides into several Branches which grow erect, and are garnished with Wedge-shaped Leaves which are sinuated. The Flowers are produced in Umbels at the End of the Branches; they are large, white, and the Petal is angular, but not divided at the Brim; these appear in *July*, and are often succeeded by small Berries, which change yellow when they are ripe.

The Seeds of the 26th Sort were sent from the *Babam Islands* by Mr. *Catesby*; this rises with a smooth shrubby Stalk, 6 or 8 Feet high, covered with a brown Bark, and divides into many Branches, garnished with Spear-shaped Leaves 3 Inches and a Half long, and 1 and a Half broad; they have a few sinuated Indentures on their Edges, and end in acute Points; they are smooth, and of a light green Colour. The Flowers are produced in small Umbels from the Side of the Stalks, standing erect; they are pretty large, white, and have their Petals cut into 5 Star pointed Segments; these are very rarely succeeded by Seeds in *England*.

The 2 last mentioned Sorts are not so tender as the 12 former Sorts, so may be treated as the 11th and 12th, by housing them in Winter with Oranges and other Green-House Plants, and in Summer place them abroad

in a sheltered Situation; these may be propagated by Cuttings, which, if planted in a shady Border during and of the Summer Months, will take Root pretty freely, and may then be taken up and potted, placing them in the Shade till they have taken new Root, and then they may be treated as the old Plants.

The 27th Sort grows naturally on the Coast of *Guinea*; this has a shrubby Stalk, which rises 7 or 8 Feet high, dividing into many Branches which have a smooth Bark. The lower Leaves are oblong, oval, about 3 Inches long, and one and a Half broad, smooth, of a dark green Colour, and stand on short Foot Stalks; the Flowers come out from the Side of the Branches in small Bunches, standing on very slender Foot Stalks; they are of the same Shape and Colour with those of the *Amomum Plinii*, but smaller; these are sometimes succeeded by Berries, about the Size of small black Cherries, which are yellow when ripe.

This Sort requires a Stove in Winter, and must not be exposed abroad longer than 10 or 12 Weeks in the warmest Part of Summer; it may be propagated by Cuttings, which, when planted, must be closely covered with a Bell or Hand Glass, and shaded from the Sun, treating them as other Cuttings of exotick Plants.

The 28th Sort grows naturally at the *Cape of Good Hope*; this has shrubby flexible Stalks, requiring Support like our common woody Nightshade, to which the Plant has great Resemblance, but the Leaves are shorter, thicker, and more indented on their Edges: This Sort very rarely flowers in *England*. There are some who have supposed this and our common woody Nightshade to be the same, which is certainly a great Mistake, for this Sort will not live abroad through the Winter in *England* in any Situation, nor does it produce Flowers here with any Treatment, for there are Plants in the *Chelsea Garden* several Years old, which have been differently managed, and yet have never flowered.

It may be easily propagated by Cuttings during any of the Summer Months, and may be preserved in a Green-house in Winter, treating it as the *Amomum Plinii*.

The 29th Sort was discovered by the late Dr. *Houfouin* at *Campeachy*; it rises with a woody Stalk, 10 or 12 Feet high, sending out many Branches which have a light gray Bark, and are smooth. The Leaves are Spear-shaped, 5 Inches long, and one and a Half broad, in the Middle, drawing to a point at both Ends; they are of a deep green on their upper Side, but hoary on their under. The Flowers are produced in large Umbels at the End of the Branches; they are small, Star-pointed, and white; their Summits, which fill up the Mouth of the Tube, are purple; these are succeeded by small Berries, the Size of middling Peas, which are yellow when ripe.

The 30th Sort was discovered at *Carthagena* in *New Spain* by the Gentleman before mentioned; this rises with a shrubby Stalk, having a light brown Bark, which divides into several irregular ligneous Branches; these are garnished with oval Leaves 4 Inches long, and two and a Half broad, smooth, of a dark-green on their upper Side, but woolly on their under. The Flowers are produced in large erect Umbels at the End of the Branches, which are pretty large, and white, shaped like

like those of the other Sorts; these are succeeded by round Berries, the Size of small Cherries sitting in the blunt woolly Empalement of the Flower, which turn yellow when ripe.

The 31st Sort was found at *Cartagena* by the same Gentleman; this rises with a strong shrubby Stalk 12 or 14 Feet high. The Branches are woody, armed with a few short recurved Spines, and have a dark brown Bark; the Leaves are oblong, oval, about 5 Inches long and 3 broad, having several sinuated Indentures on their Edges; they are of a dark green on their upper Side and smooth, but their under Sides are hairy, and of a light green. The Flowers come out from the Side of the Stalk in small Umbels; the are white, and the Petal is cut into 5 acute Segments almost to the Bottom. This has not produced Fruit here.

The 32d Sort grows in the *West-Indies*, and at the *Cape of Good Hope*; from both these Countries I have received the Seeds. The Stalk is shrubby, and rises 3 Feet high, dividing into many ligneous Branches, closely armed with short strong yellow recurved Spines. The Leaves are 2 Inches long, and 1 broad, having several sinuated Indentures, and are armed with short crooked Spines along their Mid-rib. The Flowers are produced in long loose Bunches from the Side of the Stalks; they are white, Star-pointed, and succeeded by Berries, the Size of small black Cherries, of a Gold Colour when ripe. This Sort is propagated by Seeds, and may be kept in a warm Green-house in Winter, and in Summer placed in the open Air.

The 33d Sort grows naturally at *Cartagena*; this has a shrubby Stalk, which rises 5 or 6 Feet high, sending out many Branches at the Top, which have a brown woolly Bark, and are armed with a few short recurved Spines. The Leaves are 4 Inches long, and as much in Breadth: they are deeply sinuated, and covered on both Sides with a brown woolly Down, which is a little lighter coloured on the under Side. The Flowers are produced in pretty large Bunches at the End of the Branches; they are large, and of a bright purple Colour. The Segments of the Petal spread open, and are Star-pointed; the Fruit is yellow when ripe, and the Size of gray Peas. I have also received the Seeds of this from *Bermuda*.

These Sorts are propagated by Seeds, and require the same Treatment as the tender Sorts before mentioned.

The 34th Sort grows naturally in the *West-Indies*; this hath an herbaceous Stalk which rises 2 Feet high; it is very woolly, and closely armed on every Side with slender strait yellow Spines, which renders it very troublesome to handle. The Leaves are 3 Inches long, and 2 and a Half broad; very woolly on both Sides, and cut on their Edges; they are armed all over their Surface on both Sides with the like strait Spines. The Flowers come out in small loose Bunches from the Side of the Stalks; they are large, of a pale blue Colour, and have very woolly Empalements; these are succeeded by Berries, the Size of gray Peas, of a pale yellow Colour when ripe.

The 35th Sort is very common in the Islands of the *West-Indies*, where it is titled the Batchelors Pear; this has a prickly herbaceous Stalk, which rises 3 or 4

Feet high, dividing into a few Branches at the Top; these are closely covered with a hairy Down, and armed with short recurved brown Spines. The Leaves differ in their Form and Size, some of them being near 6 Inches over each Way, others not more than half so large; they are divided into Lobes, and covered with soft Hairs, and armed on both Sides with crooked Spines. The Flowers come out from the Side of the Branches in small Bunches; they are large, of a pale blue Colour, and are succeeded by Fruit about the Size and Shape of a Catherine Pear, but the Stalk is fixed to the large End, so the Fruit seems inverted. This is of a Gold Colour when ripe.

These are Plants which require to be raised early in the Spring upon a hot Bed, and the Plants should be treated as the 15th and 16th Sorts.

The 36th Sort was sent me from *New England*; this is an annual Plant with an upright herbaceous Stalk 2 Feet and a Half high, having a smooth purple Bark. The Leaves are 4 Inches long, and 2 and a Half broad, with angular Indentures, and of a deep green Colour with purple Veins. The Flowers come from the Side of the Stalks, sometimes singly, and at others there are 3 or 4 in a Cluster; they are small, white within, and purple on their Outside; these are succeeded by Berries, the Size of common Cherries, which are red when ripe.

This is propagated by Seeds, which should be sown on a hot Bed in Spring, and when the Plants come up fit to remove, they must be planted on a fresh hot Bed to bring them forward, and afterward treated as the *Capsicums*, planting them into a warm Border in June, where they will flower in August, and if the Season proves favourable, the Seeds will ripen in Autumn, soon after which the Plants decay.

SOLDANELLA. *Tourn. Inst. R. H. 82. Tab. 16. Lin. Gen. Pl. 182. Soldanel.*

The Characters are,

The Flower has an erect permanent Empalement cut into 5 Parts; it has 1 Bell-shaped Petal spreading open gradually. The Brim is cut into acute Segments; it has 5 Awl-shaped Stamina terminated by single Summits, and a roundish Germen, supporting a slender Style, the Length of the Petal which is permanent, and crowned by an obtuse Stigma. The Germen turns to an oblong taper Capsule of 1 Cell, obliquely streaked, and opening at the Top with 10 Indentures, filled with small acute-pointed Seeds.

We have but one Species of this Genus,

SOLDANELLA Hort. Cliff. 49. Soldanel.

Soldanella Alpina, rotundifolia. C. B. P. 295. Round-leaved Soldanel of the Alps.

This Plant grows naturally on the *Alps*, and other Mountains in *Germany*. The Root is fibrous and perennial; the Leaves are almost Kidney-shaped; they are about 3 Quarters of an Inch over each Way, of a dark green Colour, and stand on long Foot Stalks. Between these arise the Foot Stalk of the Flower which is naked, about 4 Inches long, sustaining at the Top 2 small open Bell-shaped Flowers, whose Brim is cut into many fine Segments like a Fringe; the most frequent Colour of the Flower is blue, but it is sometimes found with a Snow-white Flower. After the Flower is past, the Germen becomes an oval Capsule, with the Style com-

ing out at the Top, filled with very small acute-pointed Seeds. It flowers in April, and the Seeds ripen in July.

There is another Variety of this whose Leaves are less round.

The best Method to propagate these Plants is by parting their Roots; because their Seeds do not succeed, unless perfectly ripe, and well nourished; and this rarely happens in England. Nor do the Seeds which are brought from Abroad, succeed; for they seldom grow unless sown soon after they are ripe.

The Season for transplanting and parting these Roots is in September, that they may have Time to make good Roots before Winter; for if they are removed in the Spring, they never flower very strong; and if the Season should prove dry, the Plants will decay, unless constantly supplied with Water.

The Soil, in which these Plants thrive best, is a strong cool Loam, and they must have a shady Situation; for if they are exposed to the Sun, they will not live, nor will they thrive in a warm light Soil. In dry Weather these Plants should be frequently watered, which will cause them to flower strongly, and make a good Increase.

If the Seeds ripen in England, and any Person is desirous to propagate the Plants that Way, they should be sown in Boxes or Pots filled with fresh loamy Earth soon after they are ripe, and the Boxes must be placed in a shady Situation, and frequently watered in dry Weather. The Plants will sometimes appear the same Autumn the Seeds are sown, but more frequently they do not come up till the following Spring, so that the Earth must not be disturbed, nor Weeds permitted to grow in the Boxes. When the Plants come up, they must be duly watered in dry Weather, and constantly placed in a shady Situation. The following Autumn the Plants should be taken out of the Boxes, and planted in a shady Border, about 6 or 8 Inches asunder, where they may remain to flower, or they may be intermixed with other low Alpine Plants in North Borders, where they will make an agreeable Variety.

SOLIDAGO. Lin. Gen. Pl. 859. *Virga aurea*. Tourn. Inst. R. H. 483. Tab. 735. Golden Rod, or Sarra-cens Woundwort; in French, *Verge dorée*.

The Characters are,

It has a compound Flower made up of hermaphrodite Florets, and female half Florets inclosed in 1 oblong imbricated Empalement, whose Scales are narrow, and join together. The hermaphrodite Flowers, which compose the Disk, are Funnel-shaped, and cut into 5 Points at the Brim, which spread open; they have 5 very short Hair-like Stamina terminated by cylindrical Summits, and a crowned Germen, supporting a slender Style as long as the Stamina, crowned by a bifid open Stigma. The Germen turns to a single Seed crowned with hairy Down. The female half Florets are Tongue shaped, and indented in 3 Parts; these have a crowned Germen with a slender Style crowned by 2 revolving Stigmas, succeeded by a single Seed like the hermaphrodite Florets.

The Species are,

1. **SOLIDAGO** caule erecto, foliis lanceolatis serratis, paniculis corymbosis, lateralibus terminalibusque. Woundwort with an erect Stalk, Spear-shaped sawed Leaves,

and Flowers in a Corymbus on the Side and at the Top of the Stalk. *Virga aurea latifolia serrata*. C. B. P. 268. Broad-leaved sawed Golden Rod.

2. **SOLIDAGO** caule subflexuoso angulato, racemis paniculatis erectis confertis. Lin. Sp. Pl. 880. Woundwort with an angular almost flexible Stalk, and erect Bunches of Flowers in Panicles close together. *Virga aurea vulgaris*. Park. Theat. 542. Our common Golden Rod.

3. **SOLIDAGO** foliis lineari-lanceolatis subintegerrimis, floribus confertis alaribus sessilibus. Woundwort with linear Spear-shaped Leaves almost entire, and Flowers in Clusters sitting close at the Wings of the Stalk. *Virga aurea angustifolia minus serrata*. C. B. P. 268. Narrow-leaved Golden Rod less sawed.

4. **SOLIDAGO** caule paniculato, foliis radicalibus ovatis dentatis, caulinis lanceolatis integerrimis. Woundwort with a panicled Stalk, the Bottom Leaves oval and indented, and those on the Stalks Spear-shaped and entire. *Virga aurea minor, foliis serratis utrinque acuminatis*. Rand. Smaller Golden Rod with sawed Leaves pointed at both Ends.

5. **SOLIDAGO** foliis lineari-lanceolatis subserratis subtus incanis floribus paniculatis confertis. Woundwort with linear Spear-shaped Leaves slightly sawed, hoary on their under Side, and panicled Flowers in Clusters. *Virga aurea montana, folio angusto subincano, flosculis conglobatis*. Raii Syn. 177. Mountain Golden Rod with narrow Leaves hoary on their under Side, and Flowers in round Clusters.

6. **SOLIDAGO** foliis lanceolatis serratis decurrentibus, caule angulato. Le Monier. Sauv. Monsp. 84. Woundwort with Spear-shaped, sawed, running Leaves, and an angular Stalk. *Virga aurea montana, latiore folio hirsuta*. H. R. Par. Mountain Golden Rod with a broader hairy Leaf.

7. **SOLIDAGO** foliis linearibus integerrimis, corymbis simplicibus. Hort. Cliff. 410. Woundwort with narrow entire Leaves, and single globular Flowers. *Linaria aurea affinis*. C. B. P. 213. A Plant like Golden Rod.

8. **SOLIDAGO** foliis lanceolatis subdentatis semiamplexicaulis, pedunculis lateralibus unifloris. Woundwort with Spear-shaped Leaves, slightly indented, half embracing the Stalks, and Foot Stalks with one Flower at the Wings of the Stalks. *Virga aurea omnium minima, floribus maximis*. Par. Bat. The least Golden Rod with the largest Flower.

9. **SOLIDAGO** paniculato-corymboso, racemis recurvatis, floribus adscendentibus, foliis trinerviis subserratis scabris. Hort. Upsal. 259. Woundwort with Corymbus Panicles, recurved Spikes of Flowers rising above each other, and rough Leaves having 3 Veins, and slightly sawed. *Virga aurea angustifolia, panicula speciosa Canadensis*. H. R. Par. Narrow-leaved Canada Golden Rod with a fine Panicle of Flowers.

10. **SOLIDAGO** paniculato-corymbosa, racemis recurvatis, floribus adscendentibus, foliis enerviis subintegerrimis. Hort. Upsal. 259. Woundwort with a Corymbus Panicle, recurved Spikes, Flowers rising above each other, and Leaves without Veins almost entire. *Virga aurea altissima serotina, panicula speciosa patula*. Martyn. Cent. 1. 14. Tallest late Golden Rod with a spreading Panicle.

11. *SOLIDAGO caule piloso, foliis lanceolatis serratis scabris sessilibus, racemis recurvatis alaribus, floribus pedunculatis.* Woundwort with a hairy Stalk, Spear-shaped, sawed, rough Leaves sitting close to the Stalks, recurved Spikes, and Flowers upon Foot Stalks. *Virga aurea Canadensis hirsuta, panicula minus speciosa.* Hort. R. Par. Hairy Canada Golden Rod with a less beautiful Panicle.

12. *SOLIDAGO paniculato-corymbosa, racemis obtusis patulis, foliis nervosis scabris subintegerrimis.* Woundwort with a Corymbus Panicle, obtuse spreading Spikes, and rough veined Leaves almost entire. *Virga aurea Marylandica, spicis florum racemosis, foliis integris scabris.* Mart. Dec. 2. Maryland Golden Rod with Flowers in long Bunches, and rough entire Leaves.

13. *SOLIDAGO paniculato-corymbosa, racemis longissimis recurvatis, pedunculis foliosis, foliis lanceolatis serratis scabris.* Woundwort with a Corymbus Panicle, very long recurved Spikes whose Foot Stalks are leafy, and rough, sawed, Spear-shaped Leaves. *Virga aurea rugosis foliis Virginiana, panicula florum amplissima.* Pluk. Alm. 390. Virginia Golden Rod with rough Leaves, and an ample Panicle of Flowers.

14. *SOLIDAGO caule flexuoso, foliis ovatis acuminatis serratis, racemis lateralibus simplicibus.* Flor. Leyd. Prod. 161. Woundwort with a flexible Stalk, oval, acute-pointed, sawed Leaves, and single Spikes of Flowers at the Wings of the Stalk. *Virga aurea Canadensis, serophulariae folio.* Pluk. Phyt. 235. Canada Golden Rod with a Figwort Leaf.

15. *SOLIDAGO caule flexuoso glabro, foliis ovato-lanceolatis glabris dentatis, racemis brevioribus lateralibus simplicibus.* Woundwort with a smooth flexible Stalk, oval, Spear-shaped, smooth Leaves indented, and shorter single Spikes of Flowers at the Wings of the Stalk. *Virga aurea Canadensis asterisci folie.* Par. Bat. Canada Golden Rod with a Leaf of *Asteriscus*.

16. *SOLIDAGO caule erecto glabro, racemis brevioribus lateralibus, foliis nervosis serratis glabris.* Woundwort with a smooth erect Stalk, shorter erect Spikes of Flowers at the Wings of the Stalk, and smooth, veined, sawed Leaves. *Virga aurea Canadensis, latissimo folio glabro.* Tourn. Inst. 485. Canada Golden Rod with the broadest smooth Leaf.

17. *SOLIDAGO paniculato-corymbosa, racemis recurvatis, caulibus erectis hirsutissimis, foliis lanceolatis serratis acuminatis trinerviis subtus tomentosis.* Woundwort with a Corymbus Panicle, recurved Spikes, very hairy erect Stalks, and Spear-shaped, sawed, acute-pointed Leaves with 3 Veins, woolly on their under Side. *Virga aurea Canadensis, altissima, folio subtus incano.* Tourn. Inst. 485. Tallest Canada Golden Rod with a Leaf which is hoary on the under Side.

18. *SOLIDAGO paniculato-corymbosa, racemis compositis recurvatis, foliis lineari-lanceolatis subdentatis sessilibus.* Woundwort with a Corymbus Panicle, compound recurved Spikes and linear Spear-shaped Leaves slightly indented, sitting close to the Stalks. *Virga aurea humilis, foliis rigidis utrinque acuminatis panicula speciosa.* Rand. Low Golden Rod with stiff Leaves pointed at both Ends, and a specious Panicle of Flowers.

19. *SOLIDAGO caule paniculato, foliis inferioribus ovatis dentatis, petiolis longissimis, superioribus lanceolatis se-*

miamplexicaulibus. Woundwort with a paniculated Stalk, the lower Leaves oval and indented, the upper Spear-shaped, half embracing the Stalk. *Virga aurea Novae Angliae, lato rigidoque folio.* Par. Bat. New England Golden Rod with a broad and stiff Leaf.

20. *SOLIDAGO caule obliquo, pedunculis erectis foliatis ramosis, foliis lanceolatis integerrimis.* Hort. Cliff. 409. Woundwort with an oblique Stalk, branching, erect, leafy Foot Stalks, and Spear-shaped entire Leaves. *Virga aurea Limonii folio, panicula uno versu disposita.* Tourn. Inst. 484. Golden Rod with a Sea Lavender Leaf, and a Panicle of Flowers disposed on one Side of the Stalk.

21. *SOLIDAGO caule piloso ramofo, racemis paniculatis erectis confertis, foliis hirsutis sessilibus integerrimis.* Woundwort with a hairy branching Stalk, erect Spikes of Flowers in a Panicle, and hairy entire Leaves sitting close to the Stalk. *Virga aurea, floribus fistulosis Senecionis instar, foliis angustioribus non serratis.* Hist. Oxon. 3. p. 125. Golden Rod with fistular Flowers like Groundsel, and narrow Leaves not sawed.

22. *SOLIDAGO foliis lanceolatis subcarneosis glaberrimis, margine scabriusculis, panicula corymbosa.* Lin. Sp. Pl. 878. Woundwort with Spear-shaped Leaves, almost fleshy, and very smooth, with rough Edges, and a Corymbus Panicle. *Virga aurea Canadensis, foliis carneosis latioribus.* Hist. Oxon. 3. p. 124. Canada Golden Rod with broad fleshy Leaves.

23. *SOLIDAGO panicula corymbosa, racemis supra densioribus, caule glabro laevi.* Lin. Sp. Pl. 879. Woundwort with a Corymbus Panicle, the Spikes growing closer toward the Top, and a smooth Stalk. *Virga aurea Marylandica caesia glabra.* Hort. Elsb. 414. Smooth Maryland Golden Rod.

24. *SOLIDAGO foliis lanceolato-linearibus subcarneosis glaberrimis, panicula corymbosa.* Woundwort with narrow-shaped, fleshy, very smooth Leaves, and a Corymbus Panicle. *Virga aurea Canadensis, foliis carneosis angustioribus non serratis.* Hist. Oxon. 3. p. 125. Canada Golden Rod with fleshy narrow Leaves not sawed.

25. *SOLIDAGO panicula corymbosa, foliis linearibus glaberrimis sessilibus.* Woundwort with a Corymbus Panicle, and linear very smooth Leaves, sitting close to the Stalks. *Virga aurea Novboracensis glabra, caulibus rubentibus foliis angustis glabris.* Herm. Flor. 26. Smooth Golden Rod of New York, with reddish Stalks and narrow smooth Leaves.

26. *SOLIDAGO caule paniculato racemis brevioribus confertis, foliis linearibus glabris integerrimis.* Woundwort with a paniculated Stalk, shorter Spikes of Flowers in Clusters, and narrow smooth entire Leaves. *Virga aurea Canadensis, angustifolia non serrata.* Houst. Narrow-leaved Canada Golden Rod, with Leaves not sawed.

27. *SOLIDAGO caule paniculato racemis lateralibus simplicibus pedunculis foliatis foliis lanceolatis scabris integerrimis.* Woundwort with a paniculated Stalk, single Spikes of Flowers from the Wings of the Stalk, having leafy Foot Stalks, and rough Spear-shaped entire Leaves.

28. *SOLIDAGO caule paniculato racemis erectis pedunculis foliatis, inferioribus ovatis serratis nervosis, caulibus lanceolatis integerrimis.* Woundwort with a paniculated Stalk, erect Spikes of Flowers with leafy Foot Stalks, the

the lower Leaves oval, sawed, and veined, but those on the Stalks Spear-shaped and entire. *An? Virga aurea foliis latioribus, floribus in summis virgis albis, spicatim dense dispositis.* Clayt. Flor. Virg. 97. Broad-leaved Golden Rod with white Flowers at the Top of the Branches disposed in close Spikes.

29. *SOLIDAGO caule paniculato racemis inferioribus simplicibus, summis confertissimis, foliis glabris integerrimis* Woundwort with a paniculated Stalk, the lower Spikes simple, those at the Top in very close Clusters, and entire smooth Leaves.

30. *SOLIDAGO paniculata corymbosa, racemis inferioribus recurvatis, summis erectis confertis, foliis lanceolatis serratis scabris.* Woundwort with a Corymbus Panicle, the lower Spikes recurved, the upper erect in Clusters, and Spear-shaped sawed rough Leaves.

31. *SOLIDAGO caule paniculato, racemis confertis, foliis inferioribus linearibus lanceolatis petiolatis, caulibus sessilibus glabris.* Woundwort with a paniculated Stalk, clustered Spikes of Flowers, the lower Leaves linear, Spear-shaped on Foot Stalks, and those on the Stalks smooth, sitting close.

32. *SOLIDAGO caule rotundo piloso, foliis ovato lanceolatis crenatis oppositis scabris, racemis brevissimis lateralibus.* Woundwort with a round hairy Stalk, oval, Spear-shaped, crenated, rough Leaves, standing opposite, and very short Spikes of Flowers at the Wings of the Stalk. This is the *Virga aurea Americana, urticae foliis conjugatis rugosis & hirsutis, florum spicis foliosis.* Houß. Mss. American Golden Rod with Nettle Leaves by Pairs, which are rough and hairy, and Spikes of Flowers between the Leaves.

33. *SOLIDAGO caule fruticoso, foliis lanceolatis glabris integerrimis, floribus corymbosis terminalibus.* Woundwort with a shrubby Stalk, Spear-shaped smooth entire Leaves, and Flowers in a Corymbus terminating the Stalks. *Virga aurea Americana, fruticosa, Salicis folio, floribus quasi umbellatis.* Houß. Mss. Shrubby American Golden Rod with a white Leaf and Flowers as it were in Umbels.

The 1st Sort is not very common in England, though that which grows naturally about London is generally taken for it. This grows plentifully about Brabant, and is the most common in Germany. The Stalks are stiff, of a purplish brown Colour, and rise about two Feet high. The Panicles of Flowers come out from the Wings, and at the Top of the Stalks, each Flower standing on a long, slender Foot Stalk; they are of a pale yellow Colour, and appear the Beginning of August. The Leaves are Spear-shaped, almost 4 Inches long, and one and a Quarter broad, deeply sawed on their Edges, and of a pale green on their under Side.

The 2d Sort is our common Golden Rod about London; the lower Leaves are oval, Spear-shaped, about 2 Inches long, and 1 broad, they are slightly sawed on their Edges, and have pretty long Foot Stalks; the Stalks are slender, about a Foot and a Half high, garnished with small, narrow, entire Leaves, having no Foot Stalks. The Flowers are produced in paniced Bunches, clustered together, forming a thick, erect Spike; they are yellow, and appear in August and September.

The 3d Sort is frequently found growing naturally in several Parts of England; I have often gathered it

in the Woods near Dulwich in Surry: the Stalk is round, smooth, and rises a Foot and a Half high, garnished with narrow, Spear-shaped Leaves, about an Inch and a Quarter long, and an Eighth of an Inch broad; they are almost entire, and sit close to the Stalk. The Flowers come out in small clustered Bunches, at the Wings of the Stalk, to which they sit very close, and the Stalk is terminated by a roundish Bunch; as the Flowers of this are produced at every Joint, the upper Half of the Stalk, the Spikes being short, they do not make so good an Appearance as those of the second. It flowers about the same Time.

The 4th Sort grows naturally in the Woods at Hampstead, from whence I have several Times taken the Roots, and planted them in the Garden, where they have continued many Years, and have never varied; the lower Leaves are indented; the Stalk seldom rises more than a Foot high, branching out almost from the Bottom. The Branches are terminated by short clustered Spikes of yellow Flowers which are erect; the Leaves on the Stalk and Branches, are very narrow, acute-pointed, and entire.

The 5th Sort grows naturally on the Mountains in Wales; the lower Leaves are narrow, Spear-shaped, an Inch and a Half long, and a Quarter broad, they are smooth, slightly sawed on their Edges, and a little hoary on their under Side; the Stalks rise about 6 Inches high, it is garnished with the same Sort of Leaves with those below but smaller. The Flowers grow in roundish clustered Spikes at the Top of the Stalk, are much larger than those of the common Sort, and appear 5 or 6 Weeks earlier in the Season.

The 6th Sort grows naturally on the Mountains in the South of France and Italy; the Stalk is angular, and has narrow leafy Borders, it rises about 2 Feet high; the Leaves are Spear-shaped, acute-pointed, and sawed, they are 3 Inches long, and 1 broad, of a pale green on their under Side, and hairy; the Flowers come out in close thick Spikes from the Wings of the Stalks, more than half the Length, and terminate the Stalk in a thick Spike; they are yellow, and appear in July.

The 7th Sort grows naturally in Spain and Italy; the Stalk rises a Foot and a Half high, dividing into several ligneous Branches, garnished with narrow, oblong Leaves, which are fleshy, and like those of Glasswort. The Flowers are produced at the end of the Branches in a single Corymbus, they are pretty large and yellow; they appear here late in Autumn, and make no great Appearance.

The 8th Sort grows naturally on the Alps and Pyrenees; the Stalk of this Sort rises about 4 or 5 Inches high, the Leaves are small, Spear-shaped, and indented on their Edges. The Flowers are produced singly on long slender Foot Stalks, which come out from the Wings of the Stalk. The Flowers are large and of a pale yellow Colour, they appear in June.

The 9th Sort grows naturally in North America; the Stalks are round, smooth, and rise 2 Feet high; they are garnished with narrow, rough Leaves, having 3 longitudinal Veins; they are 2 Inches and a Half long, and one Quarter of an Inch broad in the Middle, ending in acute Points, sitting close to the Stalks, and

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have sometimes a few slight Serratures on their Edges. The Flowers are gathered in a roundish Panicle at the Top of the Stalk; the lower Spikes of Flowers are reflexed, but those at the Top stand erect, and are joined very close; they are yellow, and appear in *July*.

The 10th Sort grows naturally in *North America*; the Stalks of this are round and smooth, they rise upward of 4 Feet high; the Leaves are rough, acute-pointed, and have no Veins, they stand closer together on the Stalks, and are shorter and broader than those of the ninth; the Panicles of Flowers are much larger, the Spikes much longer, they spread out wider, and are more reflexed. This flowers late in *August* and *September*.

The 11th Sort grows naturally in *North America*; the Stalks are round and hairy, they rise near 3 Feet high, and are closely garnished with rough, Spear-shaped Leaves, 2 Inches long, and Half an Inch broad, slightly sawed on their Edges, and sit close to the Stalks. The Flowers come out from the Wings, at the upper Part of the Stalk, in long recurved Spikes; they are small, of a Sulphur Colour, and stand on short Foot Stalks. This Sort flowers the End of *July*.

The 12th Sort grows naturally in *North America*; the Stalks are round, smooth, and rise 4 or 5 Feet high; they are garnished with rough Spear-shaped Leaves 2 Inches and a Half long, and half an Inch broad; they are entire, and sit close to the Stalks; the Flowers are produced in roundish Panicles at the top of the Stalks, which are composed of obtuse spreading Spikes, in close Clusters. The Flowers are yellow, and appear in *August*.

The 13th Sort grows naturally in *Virginia*; the Stalks are round, channelled, and rise 2 Feet high; the Leaves are rough, acute-pointed, and sawed; they are 2 Inches and a Half long, and 1 broad. The Flowers are produced in a Panicle at the Top of the Stalk; the Spikes are very long, recurved, and spread out on every Side; the lower Parts of the Foot Stalks are closely furnished with small Leaves, and the Flowers are in close Clusters at the End of the Spike; they are of a bright yellow Colour, and appear late in *September*.

The 14th Sort grows naturally in *North America*; the Stalks are slender, smooth, and rise 2 Feet high; they are garnished with oval, acute-pointed, sawed Leaves, 3 Inches long, and two broad, and stand alternately at 2 Inches Distance. The Flowers come out in long Bunches from the Wings of the Stalks; they are disposed loosely on the Foot Stalk, and are of a pale yellow Colour; these appear in *August*, and continue Part of *September*.

The 15th Sort grows naturally in *North America*; the lower Leaves are 4 Inches long, and almost 2 broad, their Foot Stalks are 2 Inches long, and have a Membrane or Wing on each Side. The Stalks rise 2 Feet high; they are slender, smooth, and of a light purple Colour, and garnished with oval, Spear-shaped, indented Leaves, near 2 Inches long, and 3 Quarters of an Inch broad, of a pale green on their under Side. The Flowers are produced in short Bunches, from the Wings of the Stalk almost the whole Length; the lower Spikes are an Inch long, but those on the upper Part of the Stalks, are almost round; the Flowers are of a Brimstone Colour, and appear late in *August*.

The 16th Sort grows naturally in *Canada*; the Stalks are stiff, round, smooth, and have a white Bark; they rise upward of 3 Feet high, and are garnished with smooth Spear-shaped Leaves, having several Veins; they are 3 Inches and a Half long, and 1 Inch broad, standing alternately. The Flowers come out toward the Top of the Stalk, from the Wings, in short Spikes which stand erect and are obtuse; they are of a pale yellow Colour, and appear in *August*.

The 17th Sort grows naturally in *Canada*; this rises with a strong hairy Stalk 5 or 6 Feet high, garnished closely with rough Spear-shaped Leaves ending in acute Points; they are 4 Inches long, and 1 broad, very hairy on their under Side, and sharply sawed on their Edges, having 3 strong longitudinal Veins; the Flowers are disposed in a roundish Panicle at the Top of the Stalk; the Spikes of Flowers are recurved; the Flowers are small and of a Brimstone Colour; this flowers in *September*, and frequently continues till the End of *October*.

The 18th Sort grows naturally in *North America*; the Stalks are very strong, they rise near 2 Feet high, and are very closely garnished with narrow Spear-shaped stiff Leaves, 4 Inches long, and half an Inch broad, a little indented on their Edges, sitting close to the Stalks. The Flowers are disposed in large Panicles at the Top of the Stalks, the Spikes are long, recurved, and composed of smaller Spikes in Clusters; the Flowers are yellow, and appear in *September*.

The 19th Sort grows naturally in *New England*; The Stalks rise 2 Feet high; the lower Leaves are oval, stiff, smooth, and entire, they are 4 Inches long, and 2 and a Half broad, standing on Foot Stalks 4 Inches long; those on the upper Part of the Stalk are Spear-shaped, entire, and embrace the Stalk half round with their Base. The Flowers are disposed in loose spreading Panicles at the Top of the Stalks; the Spikes are short, clustered, and roundish; the Flowers are of a bright yellow Colour, and appear in *August*.

The 20th Sort grows naturally at *Mexico*, but is hardy enough to thrive in the open Air in *England*; the Stalks are oblique, they rise a Foot and a Half high, are smooth, and have a brown Bark, garnished with smooth, Spear-shaped, entire Leaves, 3 Inches long, and three Quarters of an Inch broad. The Flowers come out on branching Foot-Stalks on the Side of the Stalks, which are ranged on one Side, and have a few small Leaves under the Flowers. The Flowers are yellow, and appear the End of *August*.

The 21st Sort grows naturally in *North America*. The Stalks are very hairy, and rise 4 Feet high, branching out toward the Bottom; the lower Part of the Stalk is garnished with rough Leaves 3 Inches long, and 1 broad; the Branches grow erect, and are garnished with small Leaves scarce one Inch long, and an Eighth broad, which are entire and sit close to the Stalk; the Flowers are disposed in a close Panicle at the Top of the Stalk, growing erect, they are yellow, and appear in *September*.

The 22d Sort grows naturally in *North America*. The lower Leaves are thick, fleshy, and Spear-shaped; they are 10 Inches long, and 1 Inch and a Half broad, and have 3 longitudinal Veins; The middle Surface of the Leaves is smooth, but their Edges are rough; they are

of a deep green Colour; the Stalks rise 4 Feet high, and are closely garnished with smooth entire Leaves, of the same Shape and Texture as the lower, but greatly diminish in their Size to the Top of the Stalk. The Flowers are disposed in a compact Panicle at the Top of the Stalk; the Spikes grow erect, and the Flowers are of a bright yellow Colour; they appear in *October*, and in mild Seasons continue great Part of *November*.

The 23d Sort grows naturally in *Maryland*; this hath a slender smooth Stalk, which rises a Foot and a Half high, garnished with narrow Spear-shaped Leaves, 2 Inches long, and Half an Inch broad, indented on their Edges, and ending in acute Points; the Flowers are disposed in a loose Panicle at the Top of the Stalk; the Spikes of Flowers are closer and thicker toward the Top. The Flowers are yellow, and appear in *September*.

The 24th Sort grows naturally in *North America*; The lower Leaves are fleshy, narrow, Spear-shaped, and entire. The Stalks are smooth, of a purplish Colour, and rise near 3 Feet high; they are garnished with long, narrow, smooth, Keel-shaped Leaves, which are entire. The Flowers are disposed in a loose Panicle at the Top of the Stalk; the Spikes are slender and erect. The Flowers are of a bright yellow Colour, and appear late in *October*, and sometimes continue till *December*.

The 25th Sort grows naturally in *New England*. The lower Leaves of this Sort are long, narrow, and very smooth, they are Keel-shaped and entire. The Stalks are red, fleshy, and smooth; they rise 2 Feet high, and are thinly garnished with narrow smooth Leaves. The Flowers are produced in loose Panicles at the Top of the Stalks; and there are some single Spikes of Flowers, which come out from the Wings of the Stalks below. The Flowers are of a bright yellow Colour, and appear in *August*.

The 26th Sort grows naturally in *North America*; the Stalks are smooth, erect, and rise a Foot and a Half high, garnished with narrow, smooth entire Leaves of a dark green Colour. The Flowers are disposed in close compact Panicles at the Top of the Stalk; the Spikes of Flowers are short, and clustered together. The Flowers are large, of a bright yellow, and appear in *September*.

The 27th Sort grows naturally in *New England*; the Stalks are round, hairy, and rise 2 Feet and a Half high, the upper Part branches out in a loose Panicle; the Leaves stand close to the Stalks; they are rough, Spear-shaped, and entire; those on the lower Part are 2 Inches long, and Half an Inch broad, but are gradually smaller to the Top. The Spikes of Flowers come out from the Wings of the Stalk, the lower are long, those above diminish to the Top; the Foot Stalks of the Spikes have many small Leaves growing along them, some of which are intermixed with the Flowers. This Sort flowers the Middle of *November*.

The 28th Sort grows naturally in *North America*; the lower Leaves are oval, 6 Inches long, and 3 broad, and end in acute Points; they are sawed on their Edges, and have several strong longitudinal Veins; their Foot Stalks are long, and have leafy Borders or Wings. The Stalks grow a Foot and a Half high, branching out almost from the Bottom, they are garnished with small,

Spear-shaped, entire Leaves. The Branches grow erect, they are closely furnished with small Leaves below, and are terminated by short close Spikes of white Flowers, which appear the End of *August*.

The 29th Sort grows naturally at *Philadelphia*; the lower Leaves are Spear-shaped, oblique, smooth, and entire, standing on long Foot Stalks. The Stalks rise from 3 to 4 Feet high; the Spikes of Flowers which come out from the Wings of the Stalks are long, blunt, and a little recurved at the End, those on the upper Part of the Stalk are erect, and clustered together in a close Spike; they are yellow, and appear in *September*.

The 30th Sort grows naturally at *Philadelphia*. The Stalks are hairy, and branch out toward the Top; they are garnished with rough Spear-shaped Leaves sitting close to the Stalks. The lower Leaves are 4 Inches long, and an Inch and a Half broad, those on the Stalks gradually diminish in their Size to the Top; they are rough, veined, and sawed on their Edges. The Flowers are disposed in a panicked Corymbus at the End of Branches; the Spikes on the lower Part are recurved, but those at the Top are clustered and erect. This Sort flowers in *September* and *October*.

The 31st Sort grows naturally at *Philadelphia*; the lower Leaves are smooth, entire, narrow, and Spear-shaped; they are 3 Inches and a Half long, and Half an Inch broad, standing on long Foot Stalks. The Stalks are round, smooth, and rise 3 Feet high; they are garnished with very small smooth Leaves which are entire and sit close to the Stalks. The Flowers grow in a close Panicle at the Top of the Stalk; they are of a bright yellow Colour, and appear in *September*.

The 32d Sort grows naturally at *La Vera Cruz*, in *New Spain*, where it was discovered by the late Dr. *Houfoun*. The Stalks are round, hairy, and rise near 3 Feet high; they are garnished with oval Spear-shaped Leaves, placed opposite upon short Foot Stalks; they are 3 Inches long, and an Inch and Quarter broad, their Surface very rough, and their Edges crenated, of a dark green on their upper Side, but pale on their under. The Flowers are produced in short Bunches from the Wings of the Leaves, at the upper Part of the Stalk; they are of a deep yellow Colour, and pretty large.

The 33d Sort grows naturally at *La Vera Cruz*, where it was discovered by the before-mentioned Gentleman. This rises with a shrubby Stalk 7 or 8 Feet high, dividing into many spreading Branches which are slender, ligneous, and covered with a smooth gray Bark. The Leaves are Spear-shaped, smooth, and entire; they are 2 Inches and a Half long, and 1 broad, of a light green, and stand on short Foot Stalks. The Flowers are produced at the End of the Branches in a loose Corymbus; they are large, of a pale yellow Colour, and stand on pretty long Foot Stalks. The common Empalement of the Flowers is cut almost to the Bottom. I believe *Petiver* has this Plant in his Museum, under the following Title, *Pulmonaria Jamaicensis, salicis folio, calycibus paleaceis*.

These Plants are all of them hardy, (except the two Sorts last mentioned) so will thrive in the open Air in *England*. Many of them have spacious Panicles of Flowers, so are great Ornaments to the *English Gardens* at the End of

of the Summer, when there is a Scarcity of other Flowers, which renders them more valuable. The 5 first Sorts are seldom admitted into Gardens as they do not make any great Appearance, but the Sorts from *North America* are better esteemed; these have been greatly increased in the Number of Sorts, of late Years, and if we can judge from the Sorts which have been introduced from *North America*, within a few Years past, we must suppose that Country abounds with many more Sorts than are yet known.

These Plants when they are once obtained, may be propagated in Plenty by parting their Roots; the best Time for doing it, is in Autumn as soon as their Flowers are past; but those Sorts which do not flower till very late in the Year, should be transplanted early in the Spring, before they begin to shoot, and the Roots may then be parted; but if the Spring should prove dry, they will require Water, to establish them well in the Ground, otherwise they will not flower strong the succeeding Autumn. Some of the Sorts spread their Roots, and propagate much faster than others, so these may be transplanted and parted every other Year, or if the Plants are wanted, they may be every Year divided; but then they will not flower so strong as those which are suffered to remain longer unremoved; and those Sorts whose Roots do not multiply so fast, should be parted once in 3 Years, if they are expected to flower strong.

The Sorts which grow tall, are not very proper Furniture for small Gardens, because they require much Room, for these should be allowed 4 or 5 Feet, otherwise their Roots will intermix with those of the neighbouring Plants, and draw away their Nourishment; therefore these Plants are proper Ornaments for large extended Walks round Fields, or for the Borders of Wood Walks, where they will make a fine Appearance during their Season of flowering; and as they require little Culture, they are adapted to those Places. They will thrive in almost any Soil, but when they are planted in good Ground, they will grow much larger, and make a better Appearance.

These Plants may also be propagated by Seeds; but it is only the early flowering Kinds which perfect their Seeds in *England*. These Seeds should be sown in Autumn soon after they are ripe, for those which are kept out of the Ground till Spring seldom succeed, or at best do not come up the same Year; they may be sown in Drills upon a Bed of fresh Earth, at about a Foot asunder, but the Seeds should be scattered pretty thick in the Drills, and covered lightly over with fine Earth. When the Plants come up, they must be kept clean from Weeds, and where they are too close, Part of them may be drawn out, and planted in a shady Border, to allow Room for the others to grow till Autumn, when they should be transplanted where they are designed to remain. The following Year they will flower, and their Roots will abide many Years.

The 2 last mentioned Sorts are Natives of a warm Country, so they will not thrive here, unless they have artificial Heat in Winter, especially the last Sort, which requires a warmer Situation than the other. These Plants should be planted in Pots, and the last should be plunged into the Tan Bed in the Stove, and treated as

other tender Plants from the same Country. This may be propagated by Cuttings, which if planted in Pots filled with loamy Earth, and plunged into a moderate hot Bed, will take Root. The other Sort is propagated by parting the Roots, as the Sort before mentioned; these should be kept in a moderate Stove in Winter, and in Summer may be placed abroad in a sheltered Situation.

SONCHUS, Sowthistle.

These are many of them Weeds in *England*, so are not planted in Gardens; for if their Seeds are once permitted to scatter on the Ground, they will soon stock it with Plants; for which Reason they should always be extirpated; not only those in the Garden, but also those in the Parts near it; because their Seeds, being furnished with Down, are wafted in the Air to a considerable Distance, where, falling on the Ground, they soon come up and prove troublesome Weeds.

SOPHORA. *Lin. Gen. Pl.* 456.

The Characters are,

The Flower hath a short Bell-shaped Empalement of 1 Leaf, cut at the Brim into 5 obtuse Segments. The Flower is of the Butterfly Kind; the Standard is oblong, broad, and reflexed on the Sides. It has 2 oblong Wings with Appendages to their Base; the Keel is of 2 Leaves, like those of the Wings, whose lower Borders join like the Keel of a Boat. It has 10 distinct Stamina which are Awl-shaped, parallel, and the Length of the Petals, hid in the Keel, and terminated by small Summits, and a taper oblong Germen supporting a Style the Length of the Stamina, crowned by an obtuse Stigma. The Germen turns to a long slender Pod, with swellings where each Seed is posited, which are roundish.

The Species are,

1. *SOPHORA foliis pinnatis, foliolis numerosis villosis oblongis* *Lin. Sp. Pl.* 373. *Sophora* with winged Leaves, having a great Number of oblong hairy Lobes, *Ervum Orientale alopecuroides perenne, fructu longissimo*. Eastern perennial Foxtail *Ervum*, with a long Fruit.

2. *SOPHORA foliis pinnatis, foliolis numerosis subrotundis* *Lin. Sp. Pl.* 373. *Sophora* with winged Leaves, composed of many roundish Lobes. *Coronilla Zeylanica, tota argentea*. *Burm. Zeyl.* Jointed poded *Colutea* of *Ceylon* all over silvery.

3. *SOPHORA foliis ternatis subsessilibus, foliolis subrotundis glabris* *Lin. Sp. Pl.* 373. *Sophora* with trifoliate Leaves sitting almost close to the Stalks, whose Lobes are roundish and smooth. *Cytisus Americanus procumbens, flore luteo, ramosissimus, qui anil suppeditat*. Trailing American *Cytisus* with a yellow Flower, and very branching, of which Indigo is made.

The 1st Sort grows naturally in the *Levant*, this has a perennial creeping Root, from which arise several erect Stalks from 3 to 4 Feet high, garnished with winged Leaves; composed of a great Number of oblong hairy Lobes ranged by Pairs along the Mid-rib, terminated by an odd one. The Flowers come out from the Wings of the Stalk in long Spikes, which stand erect close to the Stalk; they are of a pale blue Colour, and small. These appear in *July*, but are rarely succeeded by Pods in *England*.

It propagates fast enough by its creeping Root, in the same Manner as *Liquorice*, and is very hardy, so should

be planted in some Corner of the Garden, at a Distance from other Plants, because the Roots of this Plant will spread, mix with those of the neighbouring Plants, and soon over-bear them. It will thrive in almost any Soil or Situation, for I have frequently seen the Roots spread into the Middle of Gravel Walks, and send up Stalks.

The 2d Sort grows naturally in the Island of Ceylon, and the *West-Indies*, but particularly at *Jamaica*, where the Inhabitants call it Sea Side Pigeon Pea; this rises with a downy Stalk to the Height of 6 or 7 Feet, garnished with winged Leaves composed of 5 or 6 Pair of roundish woolly Lobes terminated by an odd one. The Flowers come out in short loose Spikes from the Wings of the Stalks; they are large and yellow, not much unlike those of *Spanish Broom*, but have no Scent; these are succeeded by taper woolly Pods 5 or 6 Inches long, having 4 or 5 large Swellings, in each of which is contained 1 roundish brown Seed as large as Peas.

This Plant is tender, so will not thrive in *England* out of a Stove; it is propagated by Seeds, which may be easily procured from the *West-Indies*, for the Plants do not perfect them in *England*; these should be sown in Pots, and plunged into a good hot Bed, where, if the Seeds are good, the Plants will appear in a Month or six Weeks. When these are fit to remove, they should be each transplanted into a separate Pot filled with soft loamy Earth, and plunged again into a hot Bed of Tanners Bark, observing to shade them from the Sun, till they have taken new Root; after which they must be treated as other tender Plants from the same Countries, always keeping them in the Bark Bed in the Stove, and in the Winter they should have but little Water.

The 3d Sort grows naturally in *Virginia* and *Philadelphis*; from both these Places I have received the Seeds; from this Plant there was formerly a coarse Sort of Indigo made in *America*, as there was from some other Plants, before the true Indigo Plants were introduced there: This has a perennial Root, from which arise several Stalks about a Foot high, sending out from the Bottom a great Number of small Branches; these are garnished with Leaves composed of 3 oval smooth Lobes joined together at the Foot Stalk like other trifoliate Leaves; they sit close to the Branches. The Flowers come out toward the End of the Branches in short Spikes; they are of the Butterfly Kind, yellow, and appear in *July* they are often succeeded by short swelling Pods, which in warm Seasons come to Maturity in *England*. The Stalks of this decay to the Root in Autumn.

This is propagated by Seeds, which should be sown on a warm Border in the Beginning of *April*. The best Way is to sow them in shallow Drills for the more conveniently keeping the Plants clean, for they must not be removed till their Stalks decay in Autumn, when they should be carefully taken up, and planted in a warm Border where they are designed to remain.

SORBUS. Tourn. Inst. R. H. 633. Lin. Gen. Pl. 548. The Service Tree; in French *Sorbier*.

The Characters are,

The Flower has a spreading, concave, permanent Empalement of 1 Leaf, indented in 5 Parts; it has 5 roundish concave Petals inserted in the Empalement, and about 20 Awl-shaped Stamina, also inserted in the Empalement, terminated by roundish Summits. The Germen is situated

under the Flower, supporting 3 slender Styles crowned by erect beaded Stigmas; it afterward becomes a soft umbelicated Fruit inclosing 3 or 4 oblong cartilaginous Seeds.

The Species are,

1. *SORBUS foliis pinnatis, utrinque glabris. Hall. Helv. 250.* Service Tree with winged Leaves smooth on both Sides. *Sorbus sylvestris, foliis domesticæ similis. C. B. P. 415.* Wild Service, with Leaves like the cultivated, commonly called, Quicken, Quickbeam, Mountain Ash, and in the North, Roan Tree.

2. *SORBUS foliis pinnatis, subtus tomentosis. Hall. Helv. 351.* Service Tree with winged Leaves woolly on their under Side. *Sorbus lativa. C. B. P. 451.* The cultivated Service.

The 1st Sort grows naturally in many Parts of *England*, but in the southern Counties they are seldom seen of any great Magnitude, for the Trees are commonly cut down, and reduced to Underwood, but in the North of *England* and *Wales*, where they are permitted to grow, there are Trees of very large Size. The Stems of this are covered with a smooth gray Bark; the Branches while young have a purplish brown Bark; the Leaves are winged; they are composed of 8 or 9 Pair of Long narrow Lobes terminated by an odd one; the Lobes are about 2 Inches long, and half an Inch broad toward their Base, ending in acute Points, and sharply sawed on their Edges; the Leaves on the young Trees in the Spring are hoary on their under Side, which about Midsummer goes off, and those upon the older Branches have very little at any Season. The Flowers are produced in large Bunches almost in Form of Umbels at the End of the Branches; they are composed of 5 spreading concave Petals shaped like those of the Pear Tree, but smaller; these appear in *May*, and are succeeded by roundish Berries, growing in large Bunches, which have a depressed Navel on the Top, and turn red in Autumn when they ripen.

This Tree is cultivated in the Nursery Gardens, and sold as a flowering Shrub, but, if they were permitted to grow, they would rise to a great Height, and have large Stems. The Leaves of this Tree make a pretty Variety when mixed with others, during the Time of their flowering, and also in Autumn. When their Fruit is ripe, they make a pretty Appearance, but the Blackbirds and Thrushes devour it as soon as it ripens; so that, in those Places where there is a Plenty of these Birds, there will not be any of the Fruit left to be perfectly ripe, however, as it is good Food for these Songsters, where people have a Desire of drawing a Number of them about their Habitations, they should plant a Quantity of these Trees for that Purpose.

The 2d Sort grows naturally in the warmer Parts of *Europe*, where it rises to a great Height, and becomes a large Tree, but in *England* there are few of any large Size. In the South of *France* and in *Italy*, the Fruit is served up to the Table in their Desserts, but in *England* they have not been much esteemed, which has occasioned their being so little cultivated here. There are several Varieties of this Fruit, which differ from each other in Size and Shape, as Apples and Pears do; some of these are shaped like Catherine Pears, and are nearly as large; others are depressed at both Ends, and shaped like Apples, but both these Sorts will arise from

Seeds

Seeds of the same Tree, so that those, who are desirous of having the largest and best Kinds, should propagate them by grafting or budding from those Trees whose Fruit are the fairest and best flavoured, as is practiced for other Fruits; these may be grafted or budded on Pear Stocks, which agree better for this Tree than any other except their own, for they will not take upon Apple Stocks, nor do they thrive upon the Hawthorn or Medlar near so well, though the Fruit of this Tree approaches nearer to those than any other, and are not fit for the Table till they are in a State of Decay.

The several Varieties of this Tree differ in the Number of their Seeds, in the same Manner as Pears, Apples, Quinces, and Medlars, some of them having but 3 Seeds in each Fruit, and others have 4 or 5, so that, although one of the Characters of this Genus is, that the Fruit has but 3 Seeds, yet that must be understood to be of the wild Sort, in which there are seldom more, but those of the cultivated Kind are as uncertain as the Fruit of Apples and Pears.

In Italy these Trees are very common, where they have a great Variety of Sorts, which have been obtained from Seeds, but I have not observed in the English Gardens more than 3 Sorts, and those are yet very scarce, for there are at present but few large Trees of the true Service in England, one of which was lately growing in the Gardens formerly belonging to John Tradescant at South Lambeth, near Vauxhall in Surry, who was a very curious Collector of rare Plants in King Charles the Second's Time, which Tree was near 40 Feet high, and produced a great Quantity of Fruit annually which were shaped like Pears, and there are indeed some Trees of middling Growth in the Gardens of Henry Marsh, Esq; at Hammer Smith, which produce Fruit of the Apple Shape (from whence several young Plants have been raised of late in the Nurseries near London); but these are small, compared to that in John Tradescant's Garden.

There are great Numbers of large Trees of this Service growing wild about Aubigny in France, from whence his Grace the late Duke of Richmond brought a great Quantity of the Fruit, and from the Seeds raised a great Number of young Plants in his Garden at Goodwood in Sussex.

The Leaves of this Tree differ from those of the first, in their Lobes being broader, and not so much sawed; they are also much more downy on their under Side, and the young Shoots of the Tree are covered with a white Down. The Flowers are produced in larger and more diffused Bunches, and are a little larger, but there are seldom more than 2 or 3 Fruit produced upon each Bunch. The Stamina of the Flowers are also longer than those of the wild Sort, which are the only Differences I can observe between them.

Both these Sorts may be propagated by sowing their Seeds in Pots soon after the Fruit is ripe, sheltering them under a common Frame in Winter, and plunging the Pots into a moderate hot Bed in the Spring, which will soon bring up the Plants, and when they are come up, they should be carefully kept clear from Weeds, and in dry Weather watered; but they should be exposed to the open Air, for they only Reason of putting them in a hot Bed is to forward the Growth of the

Seeds, but if, when the Plants are come up, the Bed is kept covered, it will draw the Plants, and spoil them. In this Bed the Plants should remain until the Middle of October, at which Time their Leaves will decay, when there should be a warm light Spot of Ground prepared to receive them, into which they should be planted in Rows 2 Feet asunder, and a Foot distant in the Rows, observing to take them up carefully, and to plant them as soon as possible, that their Roots may not dry.

During the Summer, the Ground should be kept constantly clear from Weeds, and in Winter there should be a little Mulch laid on the Surface of the Ground about their Roots, to protect them from being injured by Frost, but in the Spring the Ground between them should be dug, burying the Mulch therein, in doing which you must be careful not to cut or injure the Roots of the Plants.

In this Nursery they may continue 3 or 4 Years, according to their Growth, when it will be proper to transplant them out where they are to remain; the best Season for which is in October, or in the Spring just before they begin to shoot. The Soil should be warm in which they are planted, and the Situation defended from cold Winds, in which Place they will thrive, and produce Fruit in a few Years.

Those, who raise many of these Trees from Seeds, will procure some Varieties of the Fruit, from which the best may be selected, and propagated for the Table, and the others may be planted for Variety in Wildernesses or Wood Walks, or used for Stocks to graft the better Kinds upon.

The Wood of the wild Service Tree is much commended by the Wheelwright for being all Heart, and it is of great Use for Husbandmens Tools, Goads, &c. It is very white and smooth, so will polish pretty well.

There is a Sort of this with variegated Leaves preserved by such as are curious in collecting the several Sorts of striped Plants, but there is no great Beauty in it; it may be propagated by Layers, or by being budded on the plain Sort, but they become plain on a very rich Soil.

These Trees should have a moist strong Soil, but will grow in the most exposed Places, being extremely hardy, which renders them worthy of Care, since they will thrive where few other Trees will succeed.

SORREL. See Acetosa.

SOUTHERNWOOD. See Abrotanum.

SOWBREAD. See Cyclamen.

SPARTIUM. Lin. Gen. Pl. 765. Genista. Tourn. Inst. R. H. 643. Tab. 311. The Broom Tree; in French, Genêt.

The Characters are,

The Empalement of the Flower is tubulous, Heart-shaped, with a very short Margin at the Top, and has 5 small Indentures, but below the Flower the under Side is extended. The Flower is of the Butterfly Kind; the Standard, is almost Heart-shaped, large, and wholly reflexed; the Wings are oblong, oval, shorter than the Standard, and annexed to the Stamina; the Keel is oblong, and longer than the Wings, and the Borders are hairy and connected together, to which the Stamina are inserted. It has 10 unequal Stamina joined together, and gradually longer, the

upper being the shortest, and the under stands apart, terminated by oblong Summits, and an oblong hairy Germen, supporting a rising Awl-shaped Style, to which is fastened an oblong, hairy inflexed Stigma. The Germen becomes a long cylindrical obtuse Pod, of 1 Cell opening with 2 Valves, including several globular Kidney-shaped Seeds.

The Species are,

1. *SPARTIUM ramis oppositis teretibus apice floriferis, foliis lanceolatis.* Hort. Cliff. 356. Broom with taper opposite Branches whose Tops have Flowers, and Spear-shaped Leaves. *Genista juncea.* J. B. 1. p. 395. Rushy Broom commonly called Spanish Broom.

2. *SPARTIUM ramis oppositis angulatis, foliis oppositis subulatis.* Lin. Sp. Pl. 708. Broom with angular opposite Branches, and Awl-shaped opposite Leaves. *Genista radiata sive stellaris.* J. B. 1. p. 399. Radiated or starry Broom.

3. *SPARTIUM ramis angulatis, racemis lateralibus, foliis lanceolatis.* Hort. Cliff. 356. Broom with angular Branches, Flowers in Bunches from the Side, and Spear-shaped Leaves.

4. *SPARTIUM ramis subteretibus, racemis lateralibus, foliis linearibus lanceolatis.* Broom with almost taper Branches, short Bunches of Flowers on the Side, and narrow Spear-shaped Leaves. *Spartium tertium flore albo.* C. B. P. 396. A third Broom with a white Flower, commonly called white Spanish Broom.

5. *SPARTIUM foliis ternatis solitariisque, ramis inermibus angulosis.* Hort. Cliff. 356. Broom with trifoliate and single Leaves, and angular unarmed Branches. *Cytisus Genista scoparia, vulgaris, flore luteo.* Tourn. Inst. 649. Common green Broom with a yellow Flower.

6. *SPARTIUM foliis ternatis, foliolis cuneiformibus, ramis inermibus angulatis.* Broom with trifoliate Leaves, whose Lobes are Wedge-shaped, and angular unarmed Branches. *An? Cytisus-Genista Lusitanica, magno flore.* Tourn. Inst. 649. Portugal Broom with a large Flower.

7. *SPARTIUM foliis ternatis petiolatis, foliolis linearibus lanceolatis hirsutis, ramis inermibus angulatis.* Broom with trifoliate Leaves upon Foot Stalks, linear Spear-shaped Lobes which are hairy, and angular unarmed Branches.

8. *SPARTIUM foliis ternatis glabris sessilibus, ramis inermibus angulatis, leguminibus glabris.* Broom with trifoliate smooth Leaves sitting close to the Branches, which are angular and unarmed, and smooth Pods.

9. *SPARTIUM foliis solitariis ternatisque, ramis sexangularibus apice floriferis.* Lin. Sp. Pl. 709. *Spartium* with single and trifoliate Leaves, and Branches with 6 Angles with Flowers at their Tops. *Spartium orientale, filiqua compressa glabra & annulata.* Tourn. Cor. 44. Eastern Broom with round, smooth, compressed Pods.

10. *SPARTIUM foliis ternatis, ramis angulatis spinosis.* Hort. Cliff. 356. Broom with trifoliate Leaves, and angular prickly Branches. *Cytisus spinosus* H. L. Prickly *Cytisus*.

11. *SPARTIUM caule arborescente ramoso aculeata, foliis cuneiformibus confertis, floribus solitariis alaribus.* Broom with a Tree-like, branching, prickly Stalk, Wedge-shaped Leaves in Clusters, and Flowers standing singly on the Side of the Branches. *Spartium portulacæ foliis aculeatum, ebeni materie.* Plum.

Cat. 19. Prickly Broom with Purslain Leaves, or Ebony of the West-Indies.

The 1st Sort is the common Spanish Broom, which has been long cultivated in the English Gardens for the Sweetness of its Flowers: Of this there are two Varieties, if not distinct Species, which grow naturally in Spain and Portugal. The first, which is the common Sort in England, has larger Branches, and broader Leaves than the other. The Flowers are also larger, of a deeper yellow Colour, and appear earlier than those of the other, which has been of late Years introduced from Portugal.

Both these Sorts have smooth flexible Branches, which rise 8 or 10 Feet high. The lower Branches are garnished with small Spear-shaped smooth Leaves at the End of the Shoots of the same Year; the Flowers are disposed in a loose Spike; they are large, yellow, of the Butterfly Kind, have a strong agreeable Odour, appear in July, and in cool Seasons there is frequently a Succession of Flowers till September, succeeded by compressed Pods about 3 Inches long, containing 1 Row of Kidney-shaped Seeds which ripen in Autumn.

These Plants are easily propagated by Seeds, which should be sown in Spring on a Bed of common Earth in a shady Situation, where the Plants will rise very freely; they must be kept clear from Weeds the following Summer, and in Autumn may be taken up and transplanted in a Nursery, which should be chosen in a warm sheltered Situation. In taking up the Plants, there should be Care taken not to tear the Roots, for they send their Roots deep into the Ground, and are very apt to be torn if not raised with a Spade; they should be planted in Rows 3 Feet asunder, and at 1 Foot Distance in the Rows. In this Nursery they may remain a Year or two to get Strength, and then may be planted where they are to remain, for they do not succeed if removed large.

If the Seeds of these Sorts are permitted to scatter in Autumn, the Plants will come up in plenty in the Spring without Care, and may be transplanted the following Autumn, and treated as those before mentioned. These Shrubs are very ornamental to large Wood Walks in Gardens, but Hares and Rabbits are very fond of them, so that, unless they are screened from these Animals they will devour them in Winter when they have a Scarcity of other Food.

The 2d Sort grows naturally in Italy; this is a Shrub of low Growth, seldom rising 2 Feet high, but divides into many spreading Branches, so as to form a large Bush. The Branches are small, angular, and come out by Pairs opposite; the Leaves are very narrow, Awl-shaped, and placed round the Stalk spreading out like the Points of a Star; the Flowers are disposed in small Clusters at the End of the Branches; they are yellow, but not more than half the Size of those of the former, and have no Scent; they are succeeded by short hairy Pods containing 2 or 3 small Kidney-shaped Seeds in each: It flowers in June and the Seeds ripen in August. This shrub makes a pretty Appearance during the Time of its continuing in flower, and, as it is hardy, deserves a Place in Gardens.

It is propagated by Seeds, which should be sown in Autumn, for those sown in the Spring, seldom grow the

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the same Year; these may be sown in a Bed of common Earth in Rows for the more conveniently keeping them clean from Weeds. The Plants should remain in the Seed Bed till the following Autumn, when they may be either transplanted to the Places where they are to remain, or in a Nursery to grow a Year or two to get Strength, before they are planted out for good, but they will not bear transplanting when large, so should be removed young.

The third Sort rises with slender flexible Stalks, 6 or 7 Feet high, sending out slender Rush-like Branches which are angular, and toward the Bottom garnished with a few small Spear-shaped Leaves. The Flowers are produced in small Bunches about an Inch long, which come out from the Side of the Branches; they are very small, of the Butterfly Kind, and of a deep yellow Colour; these appear in July, and are succeeded by short oval swelling Pods, containing 1 large Kidney-shaped Seed, but unless the Season be warm, the Seeds do not ripen in England.

The 4th Sort has a thick Stalk covered with a rugged Bark when old; it rises 8 or 9 Feet high, sending out many slender Rush-like Branches of a silvery Colour, almost taper, which terminate in very slender bending Ends; these have a few narrow Spear-shaped Leaves on the lower Branches. The Flowers are produced in very short Spikes or Clusters on the Side of the Branches; they are small, white, and are succeeded by large oval Pods containing 1 Kidney-shaped Seed: It flowers about the same Time as the former. These are undoubtedly two distinct Species, for they always retain their Differences when raised from Seeds.

These 2 Sorts grow plentifully in Spain and Portugal, from both which Countries the Seeds may be easily procured. These Seeds should be sown the Middle of April on a Bed of fresh light Earth, but the best Way will be to sow them in Drills about half an Inch deep. The Drills should not be less than 1 Foot asunder, and the Seeds may be laid in the Drills at about 3 Inches Distance, which will allow Room for the Plants to grow till Michaelmas following, before which Time it will not be safe to remove them; nor should they be suffered to stand longer, because they shoot downright Roots very deep into the Ground, and, if these are cut or broken, when they are grown large, the Plants frequently miscarry. Although I have here directed the sowing these Seeds in April, yet it must be understood, if the Season proves favourable, otherwise it will be better to defer it longer, for these Seeds are as subject to perish in the Ground by Cold or Wet, as the Kidney Beans; therefore, when the Season is favourable for sowing them, the Seeds of the Broom may be safely sown.

At Michaelmas some of the Plants of each Kind may be taken up, and potted, to be sheltered in Winter, and others may be planted in a warm Situation, and on a dry Soil, where, if the Winter should not prove severe, they will stand very well. It will also be proper to leave some of the Plants in the Seed Bed, where, if the Winter should prove severe, they may be sheltered with Mats, and some Mulch laid about their Roots to prevent the Frost penetrating the Ground, for these Plants are so tender, as not to live abroad in hard

Frost, though, in moderate Winters, they will do very well; but it is always necessary to have a Plant or two of each Sort in Pots, that they may be sheltered in Winter to preserve the Sorts.

The 5th Sort is the common Broom, which grows naturally in England, so is not often admitted into Gardens, though, when it is in flower, it makes a much better Appearance than many others which are costly; this rises with a flexible Stalk 4 or 5 Feet high, sending out many Rush-like angular Branches which spread out on every Side. The lower Part of the Branches are garnished with trifoliate Leaves, and upward they are single. The Flowers come out upon short Foot Stalks singly on the Side of the Branches, for a considerable Length toward the Top; these are large, of the Butterfly Kind, and of a bright yellow Colour; they appear in May, and are succeeded by compressed hairy Pods containing Kidney-shaped Seeds which ripen in August. The Flowers and Branches of this Sort are used in Medicine.

The 6th Sort grows naturally in Portugal and Spain; this has stronger Stalks than our common Broom. The Branches grow more erect, and have deeper Angles; the Leaves are all trifoliate, and much larger than those of the fifth, and the Lobes are Wedge-shaped; the Flowers are larger, of a deeper yellow Colour, and have longer Foot Stalks. This flowers a little later in the Year than that, and is not so hardy.

The 7th Sort grows naturally in Portugal; this rises with a strong Stalk like the former. The Branches are angular, and grow erect; they are better furnished with Leaves than either of the other Sorts, which stand on pretty long Foot Stalks; the Lobes are small, very narrow, and hairy; the Flowers grow closer together, are larger, and of a deep yellow Colour.

The 8th Sort was brought from Portugal. The Stalks and Branches are slender, angular, and smooth, and fully garnished with very narrow trifoliate smooth, Leaves sitting close to the Stalks. The Flowers come out in long loose Spikes at the End of the Branches; they are large, of a bright yellow Colour, and are succeeded by short compressed Pods, which are smooth, containing small Kidney-shaped Seeds.

The 9th Sort grows naturally in the Levant; this has slender Stalks and Branches garnished with a few trifoliate and single Leaves toward the Bottom. The Branches have 6 Angles or Furrows; the Flowers are small, of a pale yellow Colour, and are produced in loose Spikes at the End of the Branches; they are rarely succeeded by Seeds in England.

The 10th Sort grows naturally in Italy and Spain near the Sea Coast. The Stalks rise 3 or 6 Feet high, and send out many angular flexible Branches, armed with long Spines, upon which grow trifoliate Leaves; the Flowers are produced at the End of the Branches in Clusters, each standing on a long Foot Stalk; they are of a bright yellow Colour, and appear in June; they are succeeded by short ligneous Pods, with a thick Border on their upper Edges, containing 3 or 4 Kidney-shaped Seeds. This Plant will not live abroad in England, unless it has a very warm Situation.

These Plants are raised from Seeds as the first Sort, and may be treated in the same Manner.

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The 11th Sort is very common in *Jamaica*, and several other Places in the *West-Indies*, where the Wood is cut, and sent to *England* under the Title of Ebony, though it is not the true Ebony, which is a Native of the eastern Country, and is a Plant of a very different Genus. The Wood of this *American* Ebony is of a fine greenish brown Colour, and polishes very well; so is much coveted by the Instrument Makers; and is used for several Purposes, being of a very hard durable Nature.

This Tree has a pretty thick Stem, which rises 12 or 14 Feet high, covered with a rugged brown Bark, and divides into many spreading Branches, which grow almost horizontal, and are armed with short brown crooked Spines. The Leaves are small, stiff, and Wedge-shaped, coming out in Clusters, and sit close to the Branches. The Flowers come out upon slender Foot Stalks from the Side of the Branches singly; they are of the Butterfly Kind, of a bright yellow Colour, and are succeeded by compressed Moon-shaped Pods, which inclose one Kidney-shaped Seed.

This Plant is propagated by Seeds, which must be procured from the Countries of its natural Growth, for the Plants do not produce Seeds in this Climate. These Seeds should be sown in Pots filled with light fresh Earth, early in Spring, and plunged into a good hot Bed of Tanners Bark. In about 6 Weeks after the Seeds are sown, the Plants will appear, when they must be carefully treated (being very tender while young) they must have fresh Air admitted to them every Day, when the Weather is warm, and should be frequently refreshed with Water, when the Earth in the Pots appears dry. In about 5 or 6 Weeks after the Plants appear, they will be fit to transplant, when they should be carefully shaken out of the Pots, and separated, planting each into a small Pot filled with light rich Earth, and then plunged into the hot Bed again, being careful to shade them from the Sun every Day until they have taken Root, after which Time they must be treated as other very tender exotick Plants, by giving them Air every Day in warm Weather, and watering them once in 2 or 3 Days gently, and when the Nights are cold, to cover the Glasses. In this hot Bed the Plants may remain till Autumn, when they must be removed into the Stove, and plunged into the Bark Bed. Those of them whose Roots have filled the Pots, should be carefully shifted into Pots one Size larger, before they are plunged; but as these Plants are not of quick Growth while young, they do not require to be often shifted out of the Pots. During the Winter Season they must be kept warm (especially the first Year), and must have but little Water; and in cold Weather it must be given to them in small Quantities; and if their Leaves should contract Filth, they must be washed with a Sponge to clean them, otherwise the Plants will not thrive. As these Plants are very tender, they will not live in the open Air in this Country, even in the warmest Part of the Year; therefore they must be constantly kept in the Stove, and should be kept plunged in the Bark Bed, observing in the Summer Season, when the Weather is warm, to admit a large Share of fresh Air to the Plants. With this Management the Plants will thrive very well, and in a few

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Years will produce their Flowers, when they will make a pretty Appearance in the Stove.

SPERGULA. Dillen. Gen. Nov. 7. Lin. Gen. Pl. 519. Spurrey.

The Characters are,

The Flower has a spreading permanent Empalement, composed of 5 oval concave Leaves. It has 5 oval concave spreading Petals larger than the Empalement, and 10 Awl-shaped Stamina shorter than the Petals, terminated by roundish Summits. It has an oval Germen, supporting 5 slender erect reflexed Styles, crowned by thick Stigmas, the Germen turns to an oval close Capsule with 1 Cell, opening with 5 Valves, inclosing many depressed, globular, bordered Seeds.

The Species are,

1. SPERGULA foliis verticillatis, floribus decandris. Hort. Cliff. 173. Spurrey with Leaves in Whorls, and Flowers with 10 Stamina. *Alfina Spergula dicta major*. C. B. P. 251. Greater Chickweed called Spurrey.

2. SPERGULA foliis verticillatis, floribus pentandris. Lin. Sp. Pl. 440. Spurrey with whorled Leaves, and Flowers with 5 Stamina. *Alfina spergula facie minima, seminibus emarginatis*. Tourn. Inst. 244. The least Chickweed with the Appearance of Spurrey, having bordered Seeds.

3. SPERGULA foliis oppositis subulatis laevibus, caulibus simplicibus. Lin. Sp. Pl. 440. Spurrey with Awl-shaped Smooth Leaves placed opposite, and single Stalks. *Alfina nodosa Germanica*. C. B. P. 251. Knotted German Chickweed.

There are some other Species of this Genus, which grow naturally as Weeds in *England*, so are not worthy Notice here; nor should I have mentioned these, were they not sometimes cultivated.

The 1st and 2d Sorts are cultivated in *Holland* and *Flanders*, for feeding their Cattle; the usual Time of sowing the Seeds is in *July* or *August*, that the Plants may acquire Strength before the Winter's Cold. The Use that is made of this, is to feed Sheep, and other Cattle, in Winter, when the common Grass hath perfected its Growth. This Plant seldom rises above 6 Inches high; so will not afford a very great Quantity of Food; but as it will grow on the poorest Sand, it may be cultivated in many Places to good Advantage, where no other Grass will thrive so well; and by feeding it off the Ground, the Dung of the Cattle will improve the Land. This Pasture, it is affirmed will make excellent Butter; and the Mutton fed on it, is said to be well tasted; so it is by many preferred to that fed on Turneps. Hens will greedily eat this Herb, and it makes them lay more Eggs.

This Plant, being annual, must be sown every Year; and whoever is willing to save the Seeds, should sow it in *April*, that the Plants may flower the Beginning of *July*, and the Seeds will ripen in *August*; when it must be cut before the Heads are quite brown, otherwise the Seeds will soon scatter.

The Seeds being very small, about 12 Pounds will be sufficient to sow an Acre of Land. The Ground should be well harrowed before the Seeds are sown; for if the larger Clods are not broken, there will be an uneven Crop of Grass. People in the low Country sow this Seed after a Crop of Corn is taken off the Land. The second Sort is now much cultivated in *Flanders*, though

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it is a much lower Plant than the common Sort; but they esteem it a much better Grass. The Seeds of this Kind are smaller and flatter than those of the common Sort, and have a white Border round each.

SPERMACOCE, *Dill. Hort. Elth.* 277. *Lin. Gen. Pl.* 111. Button Weed.

The Characters are,

The Flower has a small permanent Empalement indented in 4 Parts, sitting on the Germen. It has 1 cylindrical Petal, whose Tube is longer than the Empalement, and the Brim indented in 4 Parts, which spread open and are reflexed. It has 4 Awl-shaped Stamina shorter than the Petal, terminated by single Summits; and a roundish compressed Germen, situated under the Flower, supporting a single Style divided in 2 Parts at the Top, crowned by obtuse Stigmas. The Germen turns to 2 oblong Seeds joined, having 2 Horns, and convexed on one Side, and plain on the other.

The Species are,

1. **SPERMACOCE glabra**, *flaminibus inclusis*. *Lin. Sp. Pl.* 102. Smooth *Spermacece* with Stamina included in the Flower. *Spermacece verticillis tenuioribus*. *Hort. Elth.* 370. *Spermacece* with narrow Whorls.

2. **SPERMACOCE glabra**, *flaminibus extantibus*. *Lin. Sp. Pl.* 102. Smooth *Spermacece* with Stamina standing out of the Flowers. *Spermacece verticillis globosis*. *Hort. Elth.* 369. *Spermacece* with globular Whorls.

The 1st Sort grows to the Height of 2 Feet and a Half; the Stalks are stiff, a little angular, and covered with a brown Bark; the Branches come out by Pairs. There are 2 Leaves at each Joint placed opposite, which are two Inches long, and almost a Quarter of an Inch broad, and between these come out 3 or 4 smaller, which stand in Whorls round the Stalks; they are smooth, and have one strong Vein or Mid-rib in the Middle. The Flowers grow in slender Whorls toward the Top of the Stalks, they are small, white, and sit close to the Stalks, having a Whorl of small Leaves close under them; these are succeeded by 2 oblong Seeds, having small Horns which ripen in the Empalement.

The 2d Sort rises with a shrubby Stalk 3 or 4 Feet high, sending out a few slender Branches, garnished with narrow Leaves not so long as those of the former Sort; they are smooth, of a light green, and stand in a Kind of Whorls round the Stalk, 2 of them being larger than the others in each Whorl. The Flowers grow in thick globular Whorls, toward the Top of the Stalk, and 1 of the Whorls terminates the Stalk; they are small, very white, and Funnel-shaped. The Brim is cut into 4 obtuse Segments which spread open, and the Stamina stand out above the Tube of the Flower. After the Flowers are past, the Germen turns to two Seeds, shaped like those of the former Sort.

These Plants grow naturally in moist Places in Jamaica. The Inhabitants call the second Sort Button Weed. They are both propagated by Seeds, which must be sown on a hot Bed, and when the Plants come up, they must be transplanted on a fresh hot Bed to bring them forward, and afterward treated as other tender Plants, and, if they are placed in a Stove, they will live through the Winter, and produce good Seeds the following Year.

SPHÆRANTHUS *Vaill. Act. Par.* 1719. *Lin. Gen. Pl.* 893. Globe Flower.

The Characters are,

The Flowers are composed of hermaphrodite Florets, and female half Florets, included in 1 globular scaly Empalement, which is garnished with them on every Side the Receptacle. There are several of these Florets included in each partial Empalement. The hermaphrodite Florets are placed in the Center; they are Funnel-shaped, and cut into 5 Parts at the Brim; they have 5 very short Hair-like Stamina, terminated by cylindrical Summits, and a Germen, which decays, supporting a thick longer Style having a single Stigma; these are Barren. The female half Florets are situated round the Border, and have scarce any Petals, but an oblong Germen supporting a bristly Style crowned by a double Stigma; these have 1 oblong naked Seed.

The Species are,

1. **SPHÆRANTHUS pedunculis lateralibus unifloris**. Globe Flower with Foot Stalks on the Side with 1 Flower. *Sphæranthus purpurea alata ferrata*. *Burm. Zeyl.* 220. Purple winged fawed Globe Flower.

2. **SPHÆRANTHUS pedunculis ramosis terminalibus**. Globe Flower with branching Foot Stalks terminating the Branches. *Scabiosæ capitulo, chrysanthemi Myconi foliis, alato caule Maderaspatanus*. *Pluk. Phyt. Tab.* 108. 7. A Plant from Madras with a Head like Scabious, Leaves like the Corn Marygold of *Myconus*, and a winged Stalk.

The 1st Sort grows naturally in India; this rises with an herbaceous Stalk about a Foot high, which rarely branches out; it is garnished with Spear-shaped Leaves about 3 Inches long, and 1 broad in the Middle, whose Base fits close to the Stalk, and from them is extended a leafy Border or Wing, along the Stalk; they are fawed on their Edges and are of a deep green, standing alternate. The Foot Stalks of the Flowers come out from the Side of the Stalk, opposite to the Leaf; they are about 2 Inches long, and sustain 1 globular Head of Flowers at the Top, of a purplish red Colour; these are succeeded by oblong Seeds situated on the Margin, which are naked.

The 2d Sort grows naturally at Madras, and also at La Vera Cruz, in New Spain, where it was discovered by the late Dr. Houstun; this rises with an herbaceous winged Stalk about 10 Inches high, garnished with oval Spear-shaped fawed Leaves placed alternately. The upper Part of the Stalk branches out into small Divisions, terminated by Foot Stalks sustaining 3 or 4 globular Flowers of a Pale yellow Colour.

These are both annual Plants, which require a hot Bed to bring them forward in the Spring, and if the Summer proves cold, they must be kept in a Glass Case, otherwise they will not ripen Seeds here.

SPHONDYLIIUM, *Tourn. Inst. R. H.* 219. *Tab.* 170. *Heracleum*, *Lin. Gen. Pl.* 307. Cow Parsnip.

The Characters are,

It has an umbellated Flower. The principal Umbel is large, and composed of many smaller, which are flat; the Involucrum of the general Umbel has many Leaves which decay; the particular ones have from 3 to 7 Leaves which are narrow, and those on the Outside are the longest; the general Umbel is difform. The Flowers in the Middle or disk, have 5 equal crooked inflexed Petals. Those of

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if the Rays are unequal, the outer Parts being larger, oblong, bifid, and hooked. They have all 5 Stamina, longer than the Petals, terminated by small Summits, and an oval Germen, situated under the Flower, supporting 2 short Styles, crowned by single Stigmas; the Germen turns to an elliptical compressed Fruit furrowed on each Side, containing 2 compressed leafy Seeds.

The Species are,

1. SPHONDYLIIUM foliolis latioribus pinnatifidis radiis umbellis maximarum. Cow Parsnip, with very broad Wing-pointed Lobes, and the largest Rays to the Umbel. *Sphondylium vulgare hirsutum*. C. B. P. 157. Common hairy Cow Parsnip.

2. SPHONDYLIIUM foliolis angustioribus pinnatifidis serratis, radiis umbellarum minoribus. Cow Parsnip, with narrower, Wing pointed, sawed Lobes, and smaller Rays to the Umbel. *Sphondylium hirsutum, foliis angustioribus*. C. B. P. 157. Hairy Cow Parsnip with narrower Leaves.

3. SPHONDYLIIUM foliolis pinnatifidis obtusis, petiolis bispidis, radiis umbellarum inaequalibus. Cow Parsnip, with obtuse Wing pointed Leaves having prickly Foot Stalks, and the Umbels of Flowers unequal. *Sphondylium Orientale maximum*. Tourn. Car. 22. Greatest eastern Cow Parsnip.

4. SPHONDYLIIUM foliis pinnatis utrinque scabris, floribus radiatis. Cow Parsnip, with winged Leaves, rough on both Sides. *Sphondylium Alpinum parvum*. C. B. P. 157. Small Alpine Cow Parsnip.

5. SPHONDYLIIUM foliis simplicibus glabris floribus radiatis. Cow Parsnip with single smooth Leaves. *Sphondylium Alpinum glabrum*. C. B. P. 157. Smooth Alpine Cow Parsnip.

The 1st Sort grows naturally by the Side of Brooks, Ditches, and in Moist Meadows in many Parts of England. The Root of this Plant is taper, fleshy, and shoots deep in the Ground. The lower Leaves are large and winged; they are composed of 3 Pair of large Lobes placed along the Mid-rib, terminated by an odd one; the Lobes are also cut into 2 or 3 Pair of Wings almost to the Mid-rib, terminated by an odd one. The Foot Stalks of the Leaves are very hairy; the Leaves are of a deep green on their upper Side, but pale on their under, and rough to the Touch, the Stalks are garnished at each Joint with 1 Leaf of the same Shape with those at Bottom, but smaller, whose Base embraces the Stalk. The Flowers are produced in large Umbels at the Top of the Stalks, composed of about 22 partial Umbels every third having longer Foot Stalks than the others. The partial Umbels are composed of many larger Flowers which compose the Rays, and are barren, those of the Disk or Middle, are smaller and fruitful; they are white, and appear in July. These are each succeeded by two flat bordered Seeds which ripen in August.

The 2d Sort grows naturally in some moist Meadows near Battersea in Surry, and in some other Parts of England; this has been supposed only a seminal Variety of the first, but I have cultivated it in the Garden near 30 Years, and have always found the Plants which were raised from Seeds kept their Difference. The Leaves of this Sort are composed of 2 or 3 Pair of narrow Lobes, terminated by an odd one; and the Wings

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of the Lobes are very narrow, acute-pointed, and cut almost to the Mid-rib; they are hairy and of a lighter green than those of the former; the Umbels are much smaller, as are also the Flowers and Seeds, in which it greatly differs from the former.

There are Varieties of both these Sorts with purple Flowers, which do not differ in any other Particulars.

The 3d. Sort grows naturally in the Levant, and in Siberia. The Leaves are very broad, their Foot Stalks are armed with prickly Hairs, and are deeply channelled on their upper Side; they are composed of 2 or 3 Pair of very broad obtuse Lobes, terminated by an odd one, they are almost smooth, and of a yellowish green Colour. The Stalks rise 8 or 10 Feet high; they are channelled and sustain Umbels of Flowers at the Top, which are smaller than those of either of the 2 former Sorts, and the Flowers are yellow. This flowers early in June, and the Seeds ripen the Beginning of August.

The 4th Sort grows naturally on the Alps. The Stalks do not rise more than 1 Foot and a Half high, the Leaves are divided to the Mid-rib; the Lobes are a little cut on their Edges, and are of a deep green and rough on both Sides; the Umbels of Flowers are small, and white. It flowers about the same Time with the last.

The 5th Sort grows naturally on the Alps and Apennines. The Stalks of this rise almost 3 Feet high; the Leaves are smooth, about a Foot long, and a Foot and a Half broad, divided into 3 Lobes, but not very deep, and indented about the Edges. The Stalks are terminated by small Umbels of white Flowers which appear in June, and are succeeded by small compressed bordered Seeds which ripen in August.

These are all very hardy Plants, which may be propagated by Seeds; the best Time for sowing them is in Autumn, soon after they are ripe. They should be sown where the Plants are designed to remain; because they send forth Tap Roots, somewhat like those of the Parsnip, therefore do not thrive so well when transplanted, as if suffered to remain where they are sown. The Plants grow very large, therefore the Seeds should be sown in Drills, at 2 Feet and a Half, or 3 Feet Distance, and in the Spring; when the Plants appear, they should be thinned, so as to leave them at least 18 Inches asunder in the Rows; after which they will require no farther Care, but to keep them clear from Weeds; and when the Plants have obtained Strength, they will not easily be injured by Weeds; for they will overbear them and prevent their getting up. The second Year they will produce Flowers and Seeds, and their Roots soon after die; if their Seeds are permitted to scatter, they will fill the neighbouring Ground, and become troublesome Weeds.

The 1st Sort (which is very common in Germany,) hath been by some of the German Writers, taken for the *Acanthus*, or Bears-breech, and the same Qualities applied to it.

The Name of Cow Parsnip was given to this Plant, from the Cows eating it, but they do not chuse to eat the Leaves of this Plant, if they can get any other Food, as may be observed in the Fields where the Plant is in great Plenty; for the Cows will eat the Grass very close about these Plants, though they are rarely found to be touched by them, unless when the Grass

Grass is burnt up, Rabbits will eat the Leaves of this Plant, and seem fond of it.

SPIDERWORT. See Tradescantia

SPIGELIA. Lin. Gen. Pl. 192. *Arapabaca*. Plum. Nov. Gen. 10. Tab. 31. Worm Grass.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, cut into 5 acute Points; it has one Funnel-shaped Petal, whose Tube is longer than the Empalement, cut into 5 Points at the Brim which spread open. It has 5 Stamina terminated by single Summits, and a Germen composed of 2 globular Lobes, supporting 1 Awl-shaped Style the Length of the Tube crowned by a single Stigma. The Germen becomes 2 globular Seed Vessels joined sitting in the Empalement, filled with small Seeds.

The Species are,

1. SPIGELIA caule erecto, foliis quaternis sessilibus, spicis terminalibus. Worm Seed with an erect Stalk, and Leaves growing by Fours sitting close to the Stalks, which are terminated by Spikes of Flowers. *Arapabaca quadrifolia, fructu testiculato*. Plum. Nov. Gen. 11. Four-leaved *Arapabaca* with a testiculated Fruit.

2. SPIGELIA foliis oppositis ovato-oblongis acuminatis sessilibus, spicis terminalibus. Worm Grass with oblong acute-pointed Leaves growing opposite, and sitting close to the Stalks, which are terminated by Spikes of Flowers. *Lonicera spicis terminalibus, foliis ovato-oblongis acuminatis distinctis sessilibus*. Flor. Virg. 142. *Lonicera* with Spikes of Flowers terminating the Stalks, and oval, oblong, acute-pointed Leaves sitting close to the Stalks.

The 1st Sort grows naturally in moist Places, in most of the Islands of the *West-Indies*; this is an annual Plant with a fibrous Root, from which arises a strong, erect, herbaceous Stalk near a Foot and a Half high, which is channelled, and sends out 2 Side Branches opposite near the Bottom, and a little above the Middle is garnished with 4 oblong, oval, acute-pointed Leaves, placed in Form of a Cross round the Stalk, and at the same Joint come out 2 small Side Branches opposite; these, and also the principal Stalk, have 4 smaller Leaves near the Top, sitting round in the same Manner as the other, and from these arise short Spikes of herbaceous Flowers ranged on one Side the Foot Stalk. These are succeeded by roundish twin Capsules which contain many small Seeds.

This Plant is esteemed the most efficacious Medicine for the Worms yet known, and has been long used by the inhabitants of the *Brazils* as such; and also by the Negroes who taught the Inhabitants of the *British* Islands in *America* the Use of it; where it has had great Success; and from thence had the Appellation of Worm Grass given to it.

It is too tender to thrive in the open Air in *England*, so the Seeds should be sown in Pots filled with soft loamy Earth in Autumn, and plunged into the Bark Bed in the Stove, where they should remain till the Spring, when they should be plunged into a fresh hot Bed, which will bring up the Plants; these must be afterward planted into separate Pots, and plunged into another hot Bed, and shaded till they have taken new Root, after which they must be treated as other tender annual Plants from the same Countries, keeping them constantly in the hot Bed under Cover, otherwise they

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will not perfect their Seeds in *England*. This Plant flowers in *July*, and the Seeds ripen in *September*, which should be sown soon after, for if they are kept out of the Ground till Spring they frequently fail.

The 2d Sort grows naturally in *North America*, where the Inhabitants call it *Indian Pink*. This has a perennial fibrous Root, from which arise 2 or 3 erect herbaceous Stalks, about 7 or 8 Inches high, garnished with 3 or 4 Pair of oval, oblong acute-pointed Leaves, placed opposite sitting pretty close to the Stalk; they are smooth, entire, and have several Veins which diverge from the Mid-rib. The Stalk is terminated by a short Spike of Flowers, ranged on one Side the Foot Stalk; they have short Empalements cut into 5 acute Segments. The Tube of the Flower is long, narrow at the Bottom, swelling upward much larger, and cut at the Brim into 5 acute Segments, which spread open flat; the Outside of the Flower is of a bright red; and the Inside of a deep Orange Colour. These appear in *July* but the Seeds never ripen here.

This Plant is used in *North America*, for the same Purposes as the other in the *West Indies*, and is esteemed the best Medicine known for the Worms. A particular Account of the Virtues of this Plant is mentioned in the first Volume of the *Philosophical Essays*, printed at *Edinburgh*, communicated by Dr. *Garden of Carolina*.

This is not easily propagated in *England*, for the Seeds do not ripen here, and the Roots make but slow Increase so that the Plant is not very common in the *English* Gardens at present; for although it is so hardy as to endure the Cold of our ordinary Winters in the open Air; yet, as it does not ripen Seeds, the only way of propagating it is by parting the Roots, and as these do not make much Increase by Offsets, the Plants are scarce. It delights in a moist Soil, and must not be often transplanted.

SPINA ALBA. See Mespilus.

SPINACHIA. Tourn. Inst. R. H. 533. Tab. 308. Lin. Gen. Pl. 986. Spinach or Spinage; in *French* *Epinars*.

The Characters are,

The Flowers are male and female in different Plants; the male Flowers have an Empalement cut into 5 oblong, obtuse concave Segments; they have no Petals, but 5 Hair-like Stamina longer than the Empalement, terminated by oblong twin Summits; These Plants are barren. The female Flowers have permanent Empalements of 1 Leaf cut into 4 Points, 2 of which are very small; they have no Petals, but a compressed roundish Germen supporting 4 Hair-like Styles, crowned by single Stigmas. The Germen turns to a roundish Seed, shut up in the Empalement, and in some Species are almost smooth, and in others they have 2 or 3 sharp Thorns.

The Species are,

1. SPINACHIA foliis sagittatis seminibus aculeatis. Spinach with Arrow-pointed Leaves and prickly Seeds. *Spinachia vulgaris capsulae seminis aculeatae*. Tourn. Inst. 533. Common Spinach with prickly Capsules.

2. SPINACHIA foliis oblongo-ovatis, seminibus glabris. Spinach with oblong oval Leaves, and smooth Seeds. *Spinacia vulgaris, capsulae seminis non echinatae* Tourn. Inst. 533. Common Spinach with Seed Vessels not prickly.

The 1st Sort was formerly more cultivated in the *English*

Engliſh Gardens than at preſent, becauſe it is much hardier, ſo not in much Danger from Cold, therefore was generally cultivated for Uſe in Winter. The Leaves of this are triangular, and ſhaped like the Point of an Arrow; the Stalks are hollow, branching, and herbaceous; they riſe about 2 Feet high. The male Flowers are produced in long Spikes; they are herbaceous having no Petals, but each has 5 ſlender Stamina terminated by oblong twin Summits filled with a yellowiſh Farina, which, when ripe, flies out on the Plants being ſhaken, and ſpreads all round; theſe Plants after their Farina is ſhed ſoon decay. The female Flowers which are upon ſeparate Plants, ſit in Cluſters cloſe to the Stalks at every Joint; they are ſmall, herbaceous, and have neither Stamina or Petals, but have roundiſh compreſſed Germina which afterward turn to roundiſh Seeds armed with ſhort acute Spines. This Plant flowers in *June* and the Seeds ripen the Beginning of *Auguſt*.

There are 2 or 3 Varieties of this now cultivated in the Kitchen Gardens, which differ in the Size and Shape of their Leaves, and their Seeds being more or leſs prickly.

The Seeds of this Kind ſhould be ſown on an open Spot of Ground the Beginning of *Auguſt*; obſerving if poſſible, to do it when there is an Appearance of Rain; for if the Seaſon ſhould prove dry for a long Time after the Seed is ſown, the Plants will not come up regularly; Part of them may come up ſoon, and a great Part of them may remain till Rain falls, but if that ſhould not happen in a little Time after, many Times there will not be half a Crop. When the Spinach is come up, the Ground ſhould be hoed to deſtroy the Weeds, and cut up the Plants where they are too cloſe, leaving the remaining Plants about 3 or 4 Inches aſunder; but this ſhould always be done in dry Weather, that the Weeds may be deſtroyed ſoon after they are cut.

About a Month or 5 Weeks after the firſt Hoeing, the Weeds will begin to grow again; therefore the Ground ſhould be hoed the ſecond Time, obſerving, as before, to do it in dry Weather. But if the Seaſon ſhould prove moiſt, it will be proper to gather the Weeds up after they are cut, and carry them off the Ground; for if the Spinach is not cleaned from Weeds before Winter, they will grow up, and ſtiſe it ſo that in wet Weather the Spinach will rot away.

In *October* the Spinach will be fit for uſe, when you ſhould only crop off the largeſt outer Leaves, leaving thoſe in the Centre of the Plants to grow bigger; and thus you may continue cropping it all the Winter and Spring, until the young Spinach, ſowed in the Spring, is large enough for Uſe, which is commonly in *April*; at which Time the Spring advancing, the Winter Spinach will run up to Seed; ſo that it ſhould be all cut up, leaving only a ſmall Parcel to produce Seeds if wanted.

But the Ground, in which this Winter Spinach is ſown, being commonly planted with early Cabbages, it is not proper to let any of the Spinach remain there for Seed; therefore it ſhould be cleared off as ſoon as the Spinach is fit for Uſe, that the Cabbages may be earthen up, and laid clear, which is of great Service to them; wherefore you ſhould ſow a ſmall Spot of Ground

with this Sort of Spinach, on Purpoſe to ſtand for Seed, where their ſhould be no other Plants among it.

The 2d Sort differs from the firſt in having oval thick Leaves, not angular at their Baſe; the Seeds are ſmooth having no Spines, and the Stalks and Leaves are much more fleſhy and ſucculent: Of this there are 2 or 3 Varieties, which differ in the Thickneſs and Size of their Leaves, which in one are much rounder and thicker than the other.

Theſe are ſown in the Spring on an open Spot of Ground by themſelves, or mixed with Radish Seed, as is the common Practice of the *London* Gardeners, who always endeavour to have as many Crops from their Land in a Seaſon as poſſible; but where Land is cheap in the Country, it will be the better Method to ſow it alone without any other Sort of Seed mixed with it; and when the Plants come up, the Ground ſhould be hoed to deſtroy the Weeds, and cut out the Plants where too cloſe, leaving the remaining about 3 Inches aſunder; and when they are grown ſo large as to meet, you may then cut out a Part of it for Uſe, thinning the Plants, that they may have Room to ſpread, and this Thinning may be twice performed, as there is Occaſion for the Herb, at the laſt of which the Roots ſhould be left 8 or 10 Inches aſunder, and if then you hoe the Ground over again to deſtroy the Weeds, it will be of great Service to the Spinach, for if the Land is good upon which it is ſown, the Sort with broad thick Leaves, commonly called Plantain Spinach, will with this Management many Times produce Leaves as large as the broad-leaved Dock, and be extremely fine.

But in order to have a Succeſſion of Spinach through the Seaſon, it will be proper to ſow the Seed at three or four different Times in the Spring, the firſt in *January*, which muſt be on a dry Soil, the ſecond the Beginning of *February* upon a moiſt Soil, the third the Beginning of *March*, which ſhould be on a moiſt Soil, and the fourth the Beginning of *April*, but theſe late Sowings ſhould be hoed out thinner at the firſt Time than either of the former, for there will be no Neceſſity to leave it for cutting out thin for Uſe, becauſe the former Sowings will be ſufficient to ſupply the Table till theſe are full grown; beſides, by leaving it thin at firſt, it will not be apt to run up to Seed ſo ſoon as it would, if the Plants were cloſe.

Theſe Sowings here mentioned are ſuch as are practiſed by the Kitchen Gardeners near *London*, but, as this Herb is much uſed in Soups, &c. for great Tables, there ſhould be ſome Seeds ſown every three Weeks, during the Summer Seaſon, to ſupply the Kitchen, but theſe late Sowings ſhould be on moiſt ſtrong Ground, otherwiſe, if the Seaſon proves hot and dry, the Spinach will run up to Seed before the Plants obtain Strength, eſpecially if the Plants do not ſtand thin.

In order to ſave Seed of either of theſe Kinds, you ſhould ſow an open rich Spot of Ground, with the Sort you intend, in *February*, after the Danger of Froſt is over, and when the Plants are come up, they ſhould be hoed out to 6 or 8 Inches Diſtance, obſerving to cut down the Weeds at the ſame Time, and when the Plants have grown about three Weeks or a Month longer, they ſhould be hoed a ſecond Time, when they ſhould be left 12 or 14 Inches aſunder at leaſt, for when they have

have shot out their Side Branches, they will sufficiently spread over the Ground.

You must also observe to keep them clear from Weeds, which, if suffered to grow among the Spinach, will cause it to run up weak, and greatly injure it. When the Plants have run up to flower, you will easily perceive two Sorts among them, viz. male and female. The male will produce Spikes of staminate Flowers, which contain the Farina, and are absolutely necessary to impregnate the Embryos of the female Plants, in order to render the Seeds prolific. These male Plants are, by the Gardeners, commonly called She Spinach, and are often by the Ignorant pulled up as soon as they can be distinguished from the female, in order, as they pretend, to give Room for the Seed-bearing to spread, but, from several Experiments which I made on these Plants, I find, where ever the male Plants are entirely removed before the Farina is shed over the female Plants, the Seed will not grow which they produce, so that it is absolutely necessary to leave a few of them in every Part of the Spot, though there may be a great many drawn out where they are too thick, for a small Quantity of male Plants (if rightly situated) will be sufficient to impregnate a great Number of female, because they greatly abound with the Farina, which, when ripe, will spread to a considerable Distance, when the Plants are shaken by the Wind.

When the Seeds are ripe (which may be known by their changing their Colour, and beginning to shatter), the Plants should be drawn up, and spread abroad for a few Days to dry, observing to turn them every other Day, that the Seeds on both Sides may dry equally; you must also guard the Seeds from Birds, otherwise they will devour them. When it is dry, the Seeds should be threshed out, cleaned from the Dirt, and laid up for Use where Mice cannot come to them, for they are extremely fond of this Seed.

SPIRÆA. Tourn. Inst. R. H. 618. Tab. 389. Lin. Gen. Pl. 554. *Spiræa frutex*, vulg.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, plain at the Base, and cut into 5 acute Segments at the Top; it has 5 roundish oblong Petals inserted in the Empalement, and 20 or more slender Stamina, shorter than the Petals, and inserted in the Empalement, terminated by roundish Summits, and 5 or more Germina supporting as many slender Styles longer than the Stamina, crowned by headed Stigmas. The Germina turn to an oblong, acute-pointed, compressed Capsule, opening with 2 Valves, containing a few small acute-pointed Seeds.

The Species are,

1. *SPIRÆA foliis lanceolatis obtusis serratis nudis, floribus duplicato-racemosis*. Hort. Cliff. 191. *Spiræa* with Spear-shaped, obtuse, naked, sawed Leaves, and Flowers in double branching Spikes. *Spiræa salicis folio*. Tourn. Inst. 618. *Spiræa frutex* Vulg.

2. *SPIRÆA foliis lobatis serratis, corymbis terminalibus*, Lin. Sp. Pl. 489. *Spiræa* with lobated sawed Leaves, and Flowers growing in a Corymbus terminating the Stalks. *Spiræa opuli folio*. Tourn. 618. *Spiræa* with a Marsh Elder Leaf, commonly called Virginia Gelder Rose with a Currant Leaf.

3. *SPIRÆA foliis integerrimis, umbellis sessilibus*. Hort.

Upsal. 131. *Spiræa* with entire Leaves, and Umbels of Flowers sitting close to the Branches. *Spiræa hyperici folio non-crenato*. Tourn. Inst. 618. *Hypericum frutex*, vulg.

4. *SPIRÆA foliis oblongiusculis apice serratis, corymbis lateralibus*. Lin. Sp. Pl. 489. *Spiræa* with oblong Leaves whose Points are sawed, and Flowers growing in a Corymbus on the Sides of the Branches. *Spiræa Hispanica, hyperici folio crenato*. Tourn. Inst. R. H. 618. Spanish *Spiræa* with a notched Leaf.

5. *SPIRÆA foliis lanceolatis inæqualiter serratis subtus tomentosis, floribus duplicato-racemosis*. Lin. Sp. Pl. 480. *Spiræa* with Spear-shaped Leaves unequally sawed, and woolly on their under Side, and Flowers growing in doubly branching Bunches. *Ulmaria pentacarpos, integræ serratis foliis parvis subtus incanis Virginiana*. Pluk. Alm. 393. Meadow-sweet of Virginia with small entire sawed Leaves, which are hoary on their under Side, and a Fruit having five Cells.

6. *SPIRÆA foliis pinnatis, foliolis uniformibus serratis, caule fruticoso, floribus paniculatis*. Lin. Sp. Pl. 490. *Spiræa* with winged Leaves whose Lobes are uniformly sawed, a shrubby Stalk, and Flowers growing in Panicles. *Spiræa sorbi folio, tenuiter crenato, floribus in thyrsis albidis*. Amman. Ruth. 186. *Spiræa* with a Service Tree Leaf which is slightly crenated, and white Flowers growing in a Thyrs.

7. *SPIRÆA foliis lanceolatis superne serratis nervosis, subtus incanis, floribus racemosis, caule fruticoso*. *Spiræa* with Spear shaped veined Leaves sawed toward their Points, and hoary on their under Side, Flowers growing in long Bunches, and a shrubby Stalk.

8. *SPIRÆA foliis lanceolatis acutè serratis, floribus paniculatis, caule fruticoso*. *Spiræa* with Spear-shaped Leaves sharply sawed, Flowers growing in Panicles, and a shrubby Stalk.

9. *SPIRÆA foliis ternatis serratis subæqualibus, floribus subpaniculatis*. Lin. Sp. Pl. 490. *Spiræa* with trifoliate sawed Leaves almost equal, and Flowers growing in a Kind of Panicle. This is the *Ulmaria major trifolia, flore amplo pentapetalo, Virginiana*. Pluk. Alm. 393. Greater three-leaved Virginia Meadow-sweet with a large Flower having 5 Petals.

10. *SPIRÆA foliis pinnatis, foliolis uniformibus serratis, caule herbaceo, floribus cymosis*. Lin. Sp. Pl. 490. *Spiræa* with winged Leaves having uniform sawed Lobes, an herbaceous Stalk and Flowers growing on slender Foot Stalks at the Top. *Filipendula vulgaris, an molon Plinii*. C. B. P. 163. The common Dropwort.

11. *SPIRÆA foliis pinnatis, foliolis difformibus pinnatis-serratis, floribus cymosis*. *Spiræa* with winged Leaves whose Lobes are difformed, and sawed like Wings, and Flowers growing at the Tops of the Stalks on slender Foot Stalks. *Filipendula omni parte major, folio angustiori*. Boerb. Ind. alt. 1. p. 43. Dropwort greater in every Part and having a narrower Leaf.

12. *SPIRÆA foliis pinnatis, impari majore lobatis, floribus cymosis*. Flor. Lapp. 201. *Spiræa* with winged Leaves whose outer Lobe is greater and divided into Lobes, and Flowers growing in Bunches on weak Foot Stalks. *Ulmaria*. Clus. Hist. 198. Meadow-sweet, or Queen of the Meadows.

13. *SPIRÆA foliis supra decompositis, spicis paniculatis, floribus divisis*. Lin. Sp. Pl. 490. *Spiræa* with

more than decomposed Leaves, paniculated Spikes, and male and female Flowers. *Barba capra floribus oblongis*. C. B. P. 163. Goats Beard with oblong Flowers.

The 1st Sort has been long cultivated in the *English* Gardens, but, from what Country it originally came, is not very certain; it is generally sold by the Nursery Gardeners with other flowering Shrubs for planting Wilderness Work; it rises with several shrubby Stalks, very taper and rough toward the Top, and covered with a reddish Bark. The Leaves are Spear-shaped, about 3 Inches long, and 1 broad in the Middle; they are bluntly sawed on their Edges, and of a bright green Colour. In rich moist Ground the Stalks will rise 5 or 6 Feet high, but in moderate Land from 3 to 4, for their whole Height is one Year's Growth from the Root. These are terminated by Spikes of pale red Flowers; the lower Part of the Spikes are branched out into small Spikes, but the upper Parts are close and obtuse. Each Flower is composed of 5 Petals which spread open, are of a pale red or Flesh Colour, and have a great Number of Stamina, some of which stand out much beyond the Petals, but others are not so long; they are terminated by brown headed Summits, and in the Center are situated 5 Styles terminated by headed Stigmas. After the Flowers are past, the Germina turn to pointed Capsules, but they rarely come to Perfection here. This Shrub flowers in *June* and *July*, and in moist Seasons there is frequently young Shoots from the Root, which flower in Autumn.

This Plant may be propagated from Suckers, which are sent forth in Plenty from the Stems of the old Plants, or by laying down the tender Branches, which, when rooted, should be transplanted out in Rows at 3 Feet Distance, and the Plants a Foot asunder in the Rows. In this Nursery they may remain 2 Years, observing to keep the Ground clear from Weeds, and in the Spring to dig up the Ground between the Rows, so that the Roots may the more easily extend themselves; but, if they put out Suckers from their Roots, those should be taken off to keep the Shrubs within Bounds, and afterwards they may be transplanted where they are to remain, either in small Wilderness Quarters, or in Clumps of flowering Shrubs, observing to place them among other Sorts of equal Growth, the young Shoots of this Shrub, being very tough and pliable, are often used for the Tops of fishing Rods.

The 2d Sort grows naturally in *North America*, but is now as common in the *English* Gardens as the first; this rises with many shrubby branching Stalks, sometimes 8 or 10 Feet high in good Ground, but generally 5 or 6; they are covered with a loose brown Bark which falls off, and are garnished with lobed Leaves, about the Size and Shape of those of the common Currant Bush, ending in acute Points, and sawed on their Edges. The Flowers are produced in roundish Bunches at the End of the Branches; they are white with some Spots of a pale red. It flowers in *June*. This is commonly known in the Nurseries by the Title of *Virginia Gelder Rose* with a Currant Leaf; it may be propagated and managed as the former, and is equally hardy.

The 3d came originally from *Canada*, but is now as common in the Nursery Gardens as either of the former, where it is known by the Title of *Hypericum fru-*

tex but has no Affinity to *St. Johnswort*, and is only so called from the Resemblance of their Leaves; this rises with several slender shrubby Stalks, 5 or 6 Feet high, covered with a dark brown Bark, sending out small Side Branches the whole Length, garnished with small Wedge-shaped entire Leaves, which have many Punctures on their Surface like *St. Johnswort*. The Flowers are disposed in small Umbels which sit close to the Stalks, each Flower standing on a long slender Foot Stalk; they are white, composed of 5 roundish Petals which spread open, and in the Center have a great Number of Stamina almost equal in Length with the Petals. This Sort flowers in *May* and *June*, and as the Flowers are produced almost the Length of the Branches, the Shrubs make a good Appearance during the Time of their flowering.

This may be propagated by laying down the under Branches, which will take Root in the Compass of one Year, when they may be taken off, and planted in a Nursery for 2 or 3 Years (as hath been directed for the former;) after which they may be transplanted out where they are to remain, placing them with the two former, being nearly of the same Growth, where they will add to the Variety.

The 4th Sort grows naturally in *Spain*; this is not very common at present in the *English* Gardens. The whole appearance of the Shrub is so like the third, as not to be distinguished at a small Distance, the only Difference being, that the Leaves of this are broader at the Point, where they have 2 or 3 Indentures. The Flowers are like those of the former, and appear at the same Time. This may be propagated as the former.

The 5th Sort grows naturally in *Philadelphia*; this is a Shrub of lower Stature than the former. The Stalks are slender, and branch out near the Ground; they have a purple Bark covered with a gray mealy Down. The Leaves are Spear-shaped, but smaller than those of the first Sort, and unequally sawed; they are downy and veined on their under Side, but of a bright green above. The Branches are terminated by a thick Racemus of Flowers, which are branched toward the Bottom into small Spikes; the Flowers are very small, of a beautiful red Colour, and appear in *July*; the Spikes of this are longer than those of the first.

The 6th Sort grows naturally in *Siberia* upon moist Land; this is a Shrub of humble Growth in this Country, seldom rising more than 2 Feet high, putting out some Side Branches covered with a purple Bark, and garnished with winged Leaves, composed of 3 or 4 Pair of oblong oval Lobes, three Quarters of an Inch long, and half an Inch broad, sawed on their Edges, and thin in Texture. The Flowers are produced in Panicles at the End of the Branches; they are small, white, and of the same Construction with the former, they appear in *July*.

The 7th Sort grows naturally in *North America*; this has a shrubby Stalk, which rises 5 or 6 Feet high, covered with a brown Bark, dividing into many strong Branches, closely garnished toward their End with Spear-shaped Leaves 3 Inches long, and one Inch and a Quarter broad in the Middle; they have many Veins, have a hoary Meal on their under Side, and are sawed on their Edges toward their Points. The Flowers are disposed in

a Ra-

a Racemus of about two Inches and a Half in Length; they are white, and stand on short Foot Stalks; they appear late in July.

The 8th Sort grows naturally in *North America*; this rises with shrubby Stalks like the first, but sends out horizontal Branches which are slender, and covered with a brown Bark. The Leaves are Spear-shaped, of a thin Texture, and a bright green Colour on both Sides; they are slightly sawed on their Edges, but the Saws are acute. The Flowers are disposed in Panicles at the End of the Branches; they are small, white, and of the same Construction of the former, having many Stamina, a little longer than the Petals, terminated by large roundish brown Summits. This Sort flowers the Beginning of *August*.

These Sorts are propagated as the first, but, as some of them do not put out Suckers from their Roots here in any Plenty, their Branches should be laid down in Autumn, which in one Year will take Root, and may then be planted where they are to remain, or into a Nursery, where they may stand 1 or 2 Years to get Strength, before they are planted out for good.

The 9th Sort grows naturally in *North America*; this has a perennial Root, but the Stalks are annual, and rise about a Foot high, sending out Branches from the Side their whole Length; these are garnished with Leaves, which for the most Part are trifoliate, but are sometimes single, and at others by Pairs; they are about an Inch and a Half long, and half an Inch broad, ending in acute Points; they are sharply sawed on their Edges, of a bright green on their upper Side, and pale on their under. The Flowers are disposed in loose Panicles at the Top of the Stalks, standing on slender Foot Stalks; they have 5 long Spear-shaped Petals which spread open, and a great many Stamina no longer than the Tube of the Flower. This Sort flowers in *July*, and the Seeds ripen in *September*.

It is propagated by Seeds, which should be sown on a shady Border soon after they are ripe, for if they are sown in the Spring, the Plants will not come up till the Year after, and many Times fail. When the Plants appear, they must be constantly kept clean from Weeds, but they should not be removed till Autumn, when their Leaves begin to decay; then they may be either transplanted where they are to remain, or into a Nursery Border, where they may grow a Year or two to get Strength, before they are planted out for good. This Plant loves a shady Situation and a moist light Soil.

The 10th Sort is the common Dropwort, which grows plentifully on chalky Grounds in many Parts of *England*. The Roots of this consist of a great Number of oval Knobs or Glandules, fastened together by slender Fibres, from whence it had the Title of Dropwort; the Leaves spread near the Surface of the Ground, are winged, 7 or 8 Inches long, and composed of many sawed Lobes, almost placed alternately along the Mid-rib; those near the Base are the smallest, the others increase in Size to the Middle, afterward decrease again to the Point, and sit close to the Mid-rib. The Flower Stalk rises a Foot or more in Height, and has seldom more than one Leaf upon it; the Top is garnished with loose Branches of small white Flowers, standing on slender Foot Stalks constructed like those of

the other Sorts, but succeeded by several Capsules, ranged circularly: It flowers in *June*. The Roots of these Plants are used in Medicine, and are accounted diuretick. It is rarely kept in Gardens, but there is a Variety of this with double Flowers, which was found growing naturally in the North of *England*, that is kept in Gardens for Variety.

The 11th Sort was given me many Years since by the late Dr. *Boerhaave* of *Leyden*, but, from whence he received it, I do not know. The Leaves of this are much longer and narrower than those of the common Sort; the Lobes of the Leaves are unequal in Length, some being two Inches and a Half long and others not more than one Inch; they are sawed on their Edges; their Segments are opposite, and ranged like the Lobes of winged Leaves. The Flower Stalk rises much higher, and sustains a much larger Bunch of Flowers. This flowers at the same Time with the other.

The 12th Sort grows naturally on the Sides of Waters, and in low moist Meadows, in most Parts of *England*. The Stalks are angular, red, and rise 3 or 4 Feet high, garnished with winged Leaves, composed of 2 or 3 Pair of large indented Lobes, terminated by an odd one, which is much larger than the other, and divided into 3 Parts or Lobes; they are of a dark green on their upper Side, but hoary on their under. The Stalks are terminated by large loose Bunches of white Flowers, which have an agreeable Scent; these appear in *June*, and are succeeded by roundish Capsules, twisted like a Screw, filled with small Seeds.

The Leaves and Tops of this Plant are used in Medicine, but the Plants are rarely kept in Gardens. There is a Variety of it with double Flowers kept in some Gardens, and one with variegated Leaves.

The 13th Sort grows naturally on the Mountains in *Austria*; this has a perennial Root, and an annual Stalk, which rises from 3 to 4 Feet high, garnished with compounded winged Leaves, composed of several doubly-winged Leaves, each having 3 or 4 Pair of oblong Lobes terminated by an odd one; these are 2 Inches long, and almost 1 broad, sawed on their Edges, and ending in acute Points. The Flowers are disposed in long slender Spikes, formed into loose Panicles at the Top of the Stalks; they are small, white, and of two Sexes in the same Spike; they appear in *July*, but the Seeds rarely ripen here.

This Plant is kept in Gardens for Variety; it may be propagated by parting the Roots in Autumn; it loves a moist Soil and a shady Situation.

These Shrubs require no other Pruning, but to cut out all the dead Branches, and such as grow irregular, and take off all their Suckers every Year, for if these are permitted to grow, they will starve the old Plants, by drawing away their Nourishment. The Ground between them should also be dug every Spring to encourage their Roots, and every third Year a little rotten Dung buried therein, which will cause them to flower very strong.

SPIRÆA OF AFRICA. See *Diosma*.

SQUASHES. See *Pepo*.

SQUILLS. See *Scilla*.

STACHYS. *Tourn. Inst. R. H.* 186. *Tab.* 85. *Lin. Gen. Pl.* 638. Base Horehound.

The Characters are,

The Flower has a tubulous, angular, permanent Empalement cut into 5 acute Parts at the Top; it has 1 Lip-shaped Petal with a short Tube having oblong Chaps. The upper Lip is erect, hooked, and a little indented at the Point; it is large, reflexed, and cut into 3 Parts, the middle Segment being large and indented at the Point. It has 4 Awl-shaped Stamina, 2 of which are longer, and inclined to the upper Lip, the other 2 are shorter, terminated by single Summits, and a four-pointed Germen, supporting a slender Style the Length of the Stamina, crowned by a bifid acute Stigma. The Germen turns to 4 oval angular Seeds which ripen in the Empalement.

The Species are,

1. *STACHYS caule erecto sulcato tomentoso, foliis ovato-lanceolatis tomentosis crenatis, verticillis piloso-tomentosis.* Base Horehound with an erect, furrowed, woolly Stalk, oval, Spear-shaped, woolly Leaves crenated, and hairy woolly Whorls of Flowers. *Stachys major Germanica.* C. B. P. 236. Greater Germen Base Horehound.

2. *STACHYS verticillis triginta floris, calycibus pungentibus.* Hort. Upsal. 170. Base Horehound with 30 Flowers in the Whorls, and prickly Empalements. *Stachys Cretica.* C. B. P. 236. Base Horehound of Candia.

3. *STACHYS foliis lineari lanceolatis tomentosis subcrenatis, petiolis longissimis, caule fruticoso tomentoso.* Base Horehound with narrow, Spear-shaped, woolly Leaves, somewhat crenated, on very long Foot Stalks, and a shrubby woolly Stalk. *Stachys minor Italica.* C. B. P. 236. Lesser Italian Base Horehound.

4. *STACHYS foliis oblongo-ovatis crenatis pilosis, calycibus pungentibus, labii superiore piloso.* Base Horehound with oblong, oval, crenated, hairy Leaves, prickly Empalements to the Flowers, and the upper Lip hairy. *Stachys alba, latifolia major.* Barrel. Icon. 297. Greater broad-leaved white Base Horehound.

5. *STACHYS foliis cordatis obtusè serratis, verticillis minoribus lanuginosis, calycibus acutis.* Base Horehound with Heart-shaped, obtuse, sawed Leaves, smaller Whorls of Flowers which are woolly, and acute Empalements to the Flowers. *Stachys bormini folia obscure virienti flore ferrugineo.* Mor. Hort. Reg. Blas. 198. Base Horehound with an obscure green Clary Leaf, and an Iron-coloured Flower.

6. *STACHYS foliis inferioribus ovato-oblongis subcrenatis subtus tomentosis, caulibus cordatis acutis sessilibus, calycibus spinosis.* Base Horehound with oval oblong lower Leaves, slightly crenated, and woolly on their under Side, those on the Stalks being Heart-shaped, acute-pointed, and fitting close to the Stalks, and prickly Empalements to the Flowers. *Stachys elatior, flore flavescente punctato.* Ait. Phil. Lond. N. 383. Taller Base Horehound with a yellowish spotted Flower.

7. *STACHYS ramis ramosissimis, foliis lanceolatis glabris.* Hort. Cliff. 310. Base Horehound with very spreading Branches, and smooth Spear-shaped Leaves. *Galeopsis angustifolia Cretica viscosa.* Narrow-leaved viscous Hedge Nettle of Crete.

8. *STACHYS verticillis sexfloris, foliis lineari-lanceolatis semialexicaulibus.* Flor. Succ. 490. Base Horehound with Whorls of 6 Flowers, and narrow Spear-shaped Leaves which half embrace the Stalk. *Stachys palustris foetida.* C. B. P. 236. Stinking Marsh Base Horehound, or Gerara's Clown's Woundwort.

There are several other Species of this Genus, some of which grow naturally in England, and others are common in different Parts of Europe, but, as they are rarely admitted into Gardens, it would be beside my Purpose to enumerate them here.

The 1st, and the last Sort here mentioned, grow naturally in England; the first only in a few particular Places, but the latter is common by the Side of Ditches and Waters every where, and is here only mentioned, because it is a Dispensary Plant, and has been supposed a good vulnerary Herb. Of this there is another Species, which was found by Mr. Stonefreet growing wild, with narrow Leaves, shorter Stalks, longer closer Spikes of Flowers, and the Leaves distinct upon short Foot Stalks, and this has constantly retained its Difference in the Garden. Both these Sorts have creeping Roots, so will soon spread over a large Spot of Ground where they have Liberty.

The 7th Sort grows naturally in Crete; this is a low Plant with an herbaceous Stalk very branchy from the Bottom. The Stalks are slender, four-cornered, and smooth; they are garnished with a few small Spear-shaped Leaves: The whole Plant is very clammy, and smells like Bitumen. The Flowers are small, of a dirty white Colour, and stand in small Whorls round the Stalks; these appear in July, and are succeeded by roundish Seeds which ripen in Autumn.

This is propagated by Seeds, and requires to be sheltered under a Frame in Winter, being too tender to live in the open Air here.

The other Sorts are kept in Botanick Gardens for Variety, but are not cultivated in other Places, so it will be needless to mention them here.

They are all propagated by Seeds, which should be sown in March on a Bed of light fresh Earth, and when the Plants are come up, they may be planted out into other Beds about 6 Inches asunder, observing to water them until they have taken Root, after which they will require no farther Care, but to keep them clear from Weeds, till Michaelmas, when they should be transplanted where they are to remain, which must be in an open Situation, and on a dry light Soil, not rich, in which they will endure the Winter much better than in good Ground. The Summer following these Plants will flower, and in August their Seeds will ripen, when they may be gathered and preserved till Spring for sowing.

STÆHELINA. Lin. Gen. Pl. 844.

The Characters are,

The common Empalement of the Flower is oblong, cylindrical, and imbricated; the Scales are coloured and reflexed; the Flower is composed of several uniform Florets, the Length of the Empalement; they are Funnel-shaped, and of 1 Petal. The Brim is cut into 5 equal acute Points, and is Bell-shaped; they have each 5 Hair-like Stamina terminated by cylindrical Summits, and a short crowned Germen, supporting a slender Style, crowned by a double oblong Stigma. The Germen becomes a short four-cornered Seed, crowned with a feathery Down, which ripens in the Empalement.

The Species are,

1. *STÆHELINA foliis tomentosis, squamis calycinis lanceolatis.* Lin. Sp. Pl. 840. *Stæbelina* with woolly Leaves

Leaves, and Spear-shaped Scales to the Empalement. *Jacq. Ethiopica, stachades citrinæ majoribus tomentosis foliis, capitulorum spinis & squamulis ex aureo colore nitentibus. Pluk. Alm. 193. Tab. 302. Ethiopian Knapweed with woolly Leaves like the greater Goldy-locks, and the Spines and Scales of the Head of a shining Gold Colour.*

2. *STÆHELINA foliis subtrigonis, squamis calycinis crenatis. Lin. Sp. Pl. 840. Stæbelina* with Leaves almost three-cornered, and crenated Scales to the Empalement. *Santolina foliis linearibus, flore solitario terminali, squamis calycinis crenatis. Hort. Cliff. 398. Stæbelina* with linear indented Leaves, and Spear-shaped Scales to the Empalement. *Elicbrysum sylvestre, flore oblongo. C. B. P. 265. Wild Immortal Flower* with an oblong Flower.

The 1st Sort grows naturally at the *Cape of Good Hope*, from whence it was introduced into the *Dutch Gardens*; it rises with a shrubby Stalk about 3 Feet high, and divides into several Branches, garnished with long taper woolly Leaves set thinly on the Branches. The Flowers are produced at the End of the Branches in single Heads, which are pretty large, and have scaly Empalements; these terminate in Spines, and are recurved; they are composed of several Florets which are tubulous, hermaphrodite, and of a yellow Colour, each of which is succeeded by a single four-cornered Seed crowned with a feathery Down, and ripens in the Empalement, each being separated by a chaffy Scale.

The 2d Sort is a Native of the same Country; this is a low Shrub, seldom rising more than 2 Feet high, sending out many slender Branches garnished with Leaves placed alternate; there is a small Knob or Angle just under that Part where the Leaf is inserted to the Branch; the Leaves are narrow, and have 3 blunt Angles or Corners. The Branches are terminated by a single Flower, whose Empalement is oval, and like those of the Flowers of Knapweed, being imbricated. The Scales are oblong, oval, and their Points rounded; some of them have a large membranaceous Border whose Edge is crenated, and spread open; the Florets are yellow and equal, of the same Length as the Empalement; they are all hermaphrodite and have a bifid Stigma, and the Seeds have a little hairy Down on their Top.

As these Plants do not always ripen their Seeds in *England*, so they are generally propagated by Cuttings, which if planted in any of the Summer Months, and covered close with a Bell or Hand Glass, will take Root pretty freely. When these have made good Roots, they should be taken up carefully and planted in Pots filled with fresh light Earth, not too rich, and placed in the Shade until they have taken new Root; then they should be removed to a sheltered Situation where they may be intermixed with other exotic Plants till the Autumn, when they must be removed into Shelter, and treated as other Plants from the same Country. These Plants do not require any artificial Heat in Winter, but should have a dry Air, for their tender Shoots are very subject to rot with damp; therefore they will thrive better in a Glass Case, than a Green-house in Winter.

The 3d Sort grows naturally in the South of *France* and in *Spain*. This is a biennial Plant, whose Stalks

rarely rise a Foot high. The Leaves are narrow and very woolly, and have much the Appearance of one Sort of *Elicbrysum*, they are sometimes opposite, and at others alternate. The Flowers terminate the Stalks; their Empalements are long, scaly, and imbricated; the Scales end in acute Points which are recurved; the Florets are tubulous, hermaphrodite, a little longer than the Empalement, and appear in *July*, but unless the Season is warm and dry, there will be no good Seeds succeed them.

It is propagated by Seeds, which should be sown on a warm Border of light Ground in the Spring, where the Plants are designed to stand; for unless they are carefully transplanted when young, they do not bear their Removal well. When the Plants come up, they will require no other Care but to keep them clean from Weeds. The 2d Year they will flower, and, if the Season proves favourable, will ripen their Seed, and soon after decay. These Plants will live through the Winter in the open Air, provided they are on a dry poor Soil, and in a sheltered Situation; but when they are in rich Ground, they grow luxuriant in Summer, so are more liable to suffer from Cold in Winter.

STAMINA, CHIVES, or FILAMENTS, are the small Threads which encompass the Style in the Center of Flowers; upon the Tops of which the Apices or Summits, which contain the male Dust, hang, so are generally termed the male Organs of Generation.

STAMINEOUS FLOWERS are such as have a Number of Stamina, or Chives; but are destitute of fine-coloured Leaves, which are called Petals, the Stamina being only encompassed by the Flower Cup; of this Sort are the male Plants of Nettles, Spinach, Hemp, &c.

STAPELIA *Lin. Gen. Pl. 271. Asclepias, Tourn. Inst. R. H. 94. Swallow-wort or Fritillaria crassa.*

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, cut into 5 acute Segments; it has 1 large plain Petal, cut into 5 acute Segments above the Middle, and a plain 5-pointed starry Nectarium, with linear Segments, whose torn Points surround the Parts of Generation; it has 5 plain, broad, erect Stamina with linear Summits fastened on each Side the Stamina, and 2 oval plain Germina having no Style, crowned by a blunt Stigma. The Germina turn to 2 oblong taper Pods filled with compressed Seeds, crowned with a feathery Down, lying over each other like the Scales of Fish.

The Species are,

1. *STAPELIA denticulis ramorum patentibus. Vir Cliff. 20. Stapelia* with spreading Indentures to the Branches. *Asclepias Africana aizoides. Tourn. Inst. 94. African Swallow-wort* like Housefleck commonly called *Fritillaria crassa*.

2. *STAPELIA denticulis ramorum erectis. Hort. Cliff. 77. Stapelia* with erect Indentures to the Branches. *Asclepias Africana aizoides, flore pulchrè fimbriato. Com. Rar. Plant. 19. African Swallow-wort* like Housefleck with a fine fringed Flower.

There are some other Species of this Genus, which grow naturally at the *Cape of Good Hope*; the Figures and Descriptions of some Sorts, have been exhibited by the learned Dr. *Burman*, Professor of Botany at *Amsterdam*,

Amsterdam, but the 2 Species here enumerated, are all I have seen growing; there is a Variety of the first Sort mentioned in Books, with flat crested Branches, and is by some Gardeners titled Coxcomb Fritillary, but this is no other than three four or more Branches joining together and becoming flat, so will return back to its Original again, therefore is not worthy Notice.

The 1st Sort rises with many succulent Branches about the Size of a Man's little Finger, 4 or 5 Inches long, having several protuberant Indentures on their Sides, which spread open horizontally, ending in acute Points; these Branches spread on the Ground and emit Roots from their Joints, so where they have Room will extend very wide; they are angular and of a deep green Colour in Summer when they are free in Growth, but in Winter they change to a purplish Colour; they abound with a viscous Juice of a nauseous Taste. From the Side of the Branches toward their Bottom comes out the Foot Stalk of the Flower at one of the Sinuses, which is short, and sustains 1 Flower having a large thick Petal cut half Way into 5 Points like a Star which spreads open flat, these are greenish on the Outside, but yellow within, having a Circle of purple round the Nectaria and the whole Petal is finely spotted with purple, resembling the Belly of a Frog. In the Center are the 5 compressed Nectaria which are prominent of a livid Colour, which includes the genital Parts. The Flower when blown has a very foetid Odour, like that of Carrion, so like, that the Common Flesh Fly deposit their Eggs on it, which frequently are hatched, but wanting proper Food die soon after; for I have many Years watched the Progress of these, to see if the Maggots produced from these Eggs ever eat any Part of the Flower, or lived any Time, but could never observe either, nor have ever heard that any other Person of Credit has, though it has been asserted, that they have devoured great Part of the Petal, and come to maturity, changing afterward into their last State of Flies. After the Flowers are past, the double Germen changes into 4 taper Pods joined at their Base, which are near a Span long, and almost as thick as a Man's little Finger, filled with flat Seeds crowned with a feathery Down lying over each other like the Scales of Fish; but these Pods are seldom formed in *England*; for in upward of 40 Years which I have cultivated these Plants, I never saw them produce their Pods but three Times, and those were plunged into the Tan Bed in the Stove, into which the Branches had put out long Roots, and thereby became very luxuriant.

The Branches of the 2d Sort are much larger than those of the first, and stand more erect, but spread and emit Roots the same Way; they have 4 longitudinal Furrows, which divide them into 4 Angles which have protuberant Indentures on their Edges, whose Points are erect; they are nearly of the same Colour as those of the first, being of a dark green in Summer, but inclining to purple in Autumn. The Flowers come out on short Foot Stalks from the Side of the Branches; these are of the Form with those of the former, but larger; the Petal is of a thicker Substance, and on the Inside covered with fine purplish soft Hairs; the Ground of the Flower is an herbaceous yellow, streaked and

chequered with purplish Lines. This Sort produces its Flowers in much greater Plenty than the first Sort, so that in Summer and Autumn these Plants are seldom long destitute of Flowers; but I have never seen any of the Pods of this Sort produced in *England*.

Both these Plants grow naturally on the Rocks near the *Cape of Good Hope*, where they strike their Roots into the Crevices of the Rocks and spread themselves greatly. They are propagated here very easily, by taking off any of the Side Branches, during any of the Summer Months, which, when planted, put out Roots very freely. The Branches should be slipped off from the Plants to the Bottom, where they are joined by a small Ligature, so will not occasion a great Wound the Joints at the Place where they are connected being almost closed round; for if they are cut through the Branch, the Wound will be so great as to occasion their rotting when planted; these should be laid in a dry Place under Cover for 8 or 10 Days, that the wounded Part may dry and heal over, before they are planted, otherwise they will rot; then they should be planted in Pots filled with Earth composed of fresh sandy Earth, mixed with Lime Rubbish and Sea Sand; and if the Pots are plunged into a very moderate hot Bed, it will promote their taking Root; they should be now and then sprinkled with Water, but it must be given them sparingly, and as soon as they have taken Root, they must be inured to the open Air. If these Plants are kept in a very moderate Stove in Winter, and in Summer placed in an airy Glass Case, where they may enjoy much free Air, but be screened from Wet and Cold, they will thrive and flower very well, for although they will live in the open Air in Summer, and may be kept through the Winter in a good Green-house, yet those Plants will not flower so well as those managed the other Way. These Plants must have little Water given them, especially in Winter.

STAPHYLÆA Lin. Gen. Pl. 336. *Staphylodendron*, Tourn. Inst. R. H. 616. Tab. 386. Bladder Nut; in French *Nex-Coupez*.

The Characters are,

The Empalement is roundish, concave, and coloured, so large as to enclose the Flower, which has 5 oblong erect Petals like the Empalement, and a Pitcher-shaped concave Nectarium at the Bottom of the Flower, with 5 oblong erect Styles terminated by single Summits, and a thick Germen divided in 3 Parts supporting 3 Styles to which there are obtuse Stigmas contiguous. The Germen becomes 2 hard almost globular Seeds included in 3 Bladders joined by a longitudinal Seam, with an acute Point opening within.

The Species are,

1. STAPHYLÆA *foliis pinnatis*. Hort. Cliff. 112. Bladder Nut with winged Leaves. *Staphylodendron sylvestre* & *vulgare*. H. L. The common wild Bladder Nut.

2. STAPHYLÆA *foliis ternatis*. Hort. Cliff. 112. Bladder Nut with trifoliate Leaves. *Staphylodendron Virginianum trifoliatum*. H. L. Three-leaved Virginian Bladder Nut.

The 1st Sort grows naturally in Woods in several Parts of *England*, but is cultivated as a flowering Shrub in the Nursery Gardens. This hath several shrubby Stalks arising from the same Root, which grow 10 or 12

Feet

Feet high; they are covered with a smooth Bark, and divide into several Branches which are soft and pithy; they are garnished with winged Leaves composed of 2 Pair of oval Lobes terminated by an odd one; these differ greatly in Size according to the Strength and Vigour of the Shrubs; some are more than 2 Inches long, and an Inch and a Half broad; but on old weak Shrubs they are much smaller. They are smooth, entire, and of a light green Colour, standing on pretty long Foot-Stalks. The Flowers come out on long slender Foot Stalks which hang downward; These spring from the Wings of the Stalks near their Extremity. The Flowers are disposed in oblong Bunches they have each 5 oblong white Petals which expand in Form of a Rose; these appear in May, and are succeeded by inflated Capsules or Bladders composed of 3 Cells, one or two of which have a roundish smooth hard Seed, and the other are barren.

This Shrub makes a Variety when intermixed with others which flower at the same Season, though their Flowers are not very beautiful. The Nuts of this Tree being hard and smooth, are strung for Beads by the Roman Catholics in some Countries; and the Children of the poor Inhabitants eat the Nuts, though they have a disagreeable Taste.

The 2d Sort grows naturally in North America from whence it was brought into Europe, where it is now become as common in the Nursery Gardens about London, as the other Sort. This hath a more Substantial Stalk than the first; the Bark of the older Branches and Stalks is smooth and of a gray Colour, that of the young is of a light green and very smooth; the Leaves are by Threes on each Foot Stalk; the Lobes are oval ending in a Point, and their Edges are sawed; they are of different Sizes according to the Age and Strength of the Plants. The largest are 3 Inches long and 2 broad; but in old Plants the Leaves are not much more than half the Size; they are smooth and of a light green Colour. The Flowers are produced from the Side of the Branches, in longer Bunches than those of the former Sort, but their Foot Stalks are much shorter; the Flowers are of a cleaner white, and their Petals are somewhat larger than those of the first, as are also the Bladder Capsules, the Seeds are larger and ripen better than those of the common Sort. The Time of flowering and ripening the Seeds, is the same with that.

Both these Sorts are usually propagated by Suckers from the Root which the first Sort sends out in Plenty; these should be taken from the old Plants in Autumn; and their Roots trimmed, then planted in a Nursery, in Rows at 3 Feet Distance, and 1 Foot asunder in the Rows; in this Nursery the Plants should stand 1 or 2 Years, according to their Strength, and then be transplanted to the Places where they are to remain.

The Plants which are propagated in this Manner from Suckers, are very subject to put out Suckers in greater Plenty from their Roots, than those raised from Seeds or propagated by Layers or Cuttings, so are not to be chosen when the others can be had; therefore those who propagate them for their own Use, should prefer the other Methods. If they are propagated by Layers, the young Branches should be laid down in Autumn, as is practised for other Trees and Shrubs; these

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will have put out Roots the following Autumn, when they may be taken from the old Plants, and planted in a Nursery where they may grow 1 or 2 Years to get Strength, and then may be removed to the Places where they are to stand.

When these are propagated by Cuttings, it should be the Shoots of the former Year, and if they have a small Piece of the two Years Wood at the Bottom, they will more certainly succeed; for as the young Shoots are soft and pithy, they are very subject to rot, when they have no Part of the old Wood to them. They should be planted in Autumn on a shady Border; but must not have too much wet.

They may also be propagated by sowing their Seeds early in Autumn, in Beds of light fresh Earth, and when the Plants are come up, they must be carefully kept clear from Weeds, and in very dry Weather, if they are now and then refreshed with Water, it will greatly promote their Growth; in these Beds they may remain until October following; at which Time they should be carefully taken up, and planted in a Nursery, placing them in Rows 3 Feet asunder, and the Plants one Foot Distance in the Rows; and, if the following Spring should prove very dry, it will be convenient to give them a little Water, to encourage their taking Root; after which they will require no farther Care, but to keep the Ground clear from Weeds in Summer and every Spring to prune off irregular Branches, and dig the Ground between the Rows, to loosen the Earth, that their Roots may the more easily extend. In this Nursery they may remain 2 Years; by which Time it will be proper to transplant them out where they are to remain, either in Wilderness Quarters, or in Clumps of various Trees, where they will add to the Diversity. The best Season for transplanting these Trees is in Autumn, with other deciduous Trees. When these Seeds are sown in the Spring, the Plants seldom come up till the following Year.

AFRICAN BLADDER-NUT. See Royena.

LAUREL-LEAVED AMERICAN BLADDER-NUT. See Pilea.

STAR FLOWER. See Ornithogalum.

STARWORT. See Aster.

STATICE, *Tourn. Inst. R. H. 341. Tab. 177. Lin. Gen. Pl. 348.* Thrift or Sea Pink.

The Characters are,

The Flowers are collected in a roundish Head, having a common scaly Empalement; each Flower has a Funnel-shaped Empalement of 1 Leaf; the Flowers have 5 Petals, they are Funnel-shaped; the Base of the Petals is narrow, their Points broad, obtuse, and spread open; they have 5 Stamina shorter than the Petals, terminated by prostrate Summits; and a small Germen supporting 5 Styles which stand apart, crowned by acute Stigmas. The Germen turns to 1 small roundish Seed inclosed in the Empalement.

The Species are,

1. *STATICE foliis lanceolato-linearibus, squamis calycinis inferioribus acutis.* Thrift with Spear-shaped linear Leaves, and the lower Scales of the Empalement acute-pointed. *Caryophyllus montanus major, flore globoso. C. B. P. 211.* Greater Mountain Pink with a globular Flower.

2. *STATICE foliis linearibus subulatis, squamis calycinis obtusis.*

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obtus. Thrift with linear Awl-shaped Leaves, and obtuse Scales to the Empalement. *Statice montana minor.* Tourn. Inst. R. H. 341. Smaller Mountain Thrift.

3. *STATICE foliis linearibus planis, squamis calycinis obtusis.* Thrift with plain linear Leaves and obtuse Scales to the Empalement. *Caryophyllus marinus minimus, flore globofo.* H. P. Blasf. The least Sea Pink with a globular Flower.

The 1st Sort grows naturally on the *Alps*, and other cold Mountains in several Parts of *Europe*. This has a perennial fibrous Root, from which come out many narrow Spear-shaped Leaves, about 4 Inches long and half an Inch broad in the widest Part; they are smooth, of a dark green Colour, and sit close over each other at their Base. The Foot Stalks of the Flowers rise about a Foot high; they are naked, and terminated by 1 globular Head containing several small, pale, red Flowers, included in one common scaly Empalement; the lower Scales are acute pointed, and immediately under the Flower is placed 5 narrow Leaves which afterward fall off. This Plant flowers in *June*, and the Flowers are succeeded by oblong Seeds closely wrapped up in the particular Empalement of the Flower, and which ripen in *August*. There is a Variety of this with white Flowers.

The 2d Sort is also a Native of the *Alps*, and other cold Mountains, where it seldom rises more than 2 Inch-high, but when it is planted in Gardens, it becomes much larger. The Roots are fibrous and perennial; they divide into Heads, which have a great Number of narrow Grass-like Leaves, which have 3 Corners at their Base, sitting close round the Heads, whose Base embrace the Stems and lie over each other. The Stalks are naked and rise about 6 Inches high, sustaining on their Tops, Heads of pale purplish Flowers, inclosed in one common scaly Empalement, whose Scales are broad and rounded at their Points. The Flowers appear the latter End of *May*, and, if the Season is not very hot, they will continue good Part of *June*.

There is a Variety of this with bright red Flowers, commonly called scarlet Thrift; the Flowers make a much better Appearance than those of the other, so has been much more cultivated in Gardens, but neither of the Kinds, are greatly esteemed at present.

The 3d Sort grows naturally in Salt Marshes, where the Sea flows over them frequently, in many Parts of *England*, so is very rarely admitted into Gardens. The Leaves of this Sort are very narrow, short and plain, the Stalks seldom rise more than 3 or 4 Inches high; the Heads of Flowers are small, and the Flowers are of a very pale Flesh Colour, so make but little Appearance; it flowers later in the Season than either of the former.

There was some Years past another Species of this Genus in the *English* Gardens; which came from *Portugal*. This had a thick perennial Stalk which by Age became shrubby; and rose to be a Foot and an Half in Height; the Leaves are like those of the first Sort, but much larger; the Foot Stalks of the Flowers were a Foot and a Half long, naked, and terminated by one large globular Head of Flowers, of a pale red Colour, but all the Plants of this Kind which were in *England*, the severe Frost in the Beginning of the Year

S T E

1740 destroyed, since which Time I have not seen on of them.

The 2d Sort has been planted in Gardens, to make Edgings on the Side of Borders; for which Purpose they were formerly in great Esteem, but of late they have been very justly rejected; because there was a Necessity of transplanting these Edgings every Year, otherwise they could not be kept within due Bounds; besides, wherever a Plant failed, which was no extraordinary Thing, there always appeared a large unsightly Gap; however, though they are not in Use at present for that Purpose, yet a few Plants of the first and second should have a Place in some Part of the Flower Garden, for Variety; especially the Variety with red Flowers which will grow in almost any Soil or Situation; and their Flowers will continue a long Time in Beauty.

All these Sorts may be propagated by parting their Roots; the best Time for which is in Autumn, that they may take Root before the Frost, which will cause them to flower much stronger than those transplanted in Spring; and the Plants will not be in so much Danger of miscarrying as those are, especially when the Spring happens to prove dry. After these Plants have taken Root, they will require no farther Care, but to keep them clear from Weeds, and to transplant and part their Roots annually, for if they are permitted to stand longer unremoved, they are very subject to rot and decay, especially when planted in good Ground.

STATUES and VASES contribute very much to the Embellishment and Magnificence of a Garden, and extremely advance the natural Beauties of it.

They are made of several Forms, and different Materials. The richest are those of cast Brass, Lead gilt, and Marble; the ordinary Sort are of a common Stone, or Stucco.

STELLATE Plants are such as have their Leaves placed at certain Knots or Intervals of the Stalks in Form of a Star: Of this Tribe are Madder, Goose-grass, Ladies Bedstraw, &c.

STERILITY signifies Barrenness.

STEWARTIA. *Lin. Gen. Pl.* 758.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf cut into 5 oval concave Segments; it has 5 large oval Petals which spread open, and a great Number of slender Stamina joined in a Cylinder at Bottom, and shorter than the Petals to which they are connected at their Base, and terminated by roundish prestrate Summits, with a roundish hairy Germen, supporting 5 Styles the Length of the Stamina crowned by obtuse Stigmas. The Germen turns to a five-cornered Capsule with 5 Cells, opening with 5 Valves whose Cells are closed, each containing 1 oval compressed Seed.

We know but one Species of this Genus, viz.

STEWARTIA. *Ath. Ups.* 1741. *Lin. Sp. Pl.* 698. *Stewartia*. This is the *Malacodendron*. *Mitch.*

The Title of this Genus was given it in Honour of the Right Honourable the Earl of Bute, whose great Knowledge of the Science of Botany is well known.

This Shrub grows naturally in *Virginia*, where it rises with strong ligneous Stalks, 10 or 12 Feet high, sending out Branches on every Side covered with a brown Bark, and garnished with oval Spear-shaped Leaves about

about 2 Inches and a Half long, and one and a Half broad; they are sawed on their Edges, and pretty much veined, standing alternately. The Flowers are produced from the Wings of the Stalk; their Empalements are of 1 Leaf cut into 5 obtuse Segments almost to the Bottom. The Flower is of one Petal (according to Ray and Tournesort), cut into 5 Parts almost to the Bottom, but their Bases are connected together, and fall off united; the Segments are narrow at their Base, but spread open, are broad and obtuse at their Points, and hollowed like a Spoon in the Middle; they are white, but one of the Segments in each Flower is stained with an herbaceous yellow Colour. In the Center of the Flower arise 5 Styles surrounded by a Circle of purple Stamina, terminated by roundish blue Summits. The Stamina are inserted to the Base of the Petals, so form at their Base one Body, being there connected together. It flowers the latter End of May. The Fruit of this is a conical dry ligneous Capsule having 5 sharp Angles, and 5 Cells, which open at the Top with 5 Valves, each Cell containing 1 oblong smooth Seed.

This Shrub is at present very rare in the English Gardens. The Seeds are seldom brought to England, and those frequently fail, either by their not having been properly impregnated, or duly ripened, for I have examined several which have been hollow, having only a Shell, and when the Plants come up, they are very difficult to maintain while young, for if they are exposed to too much Sun, they will soon be destroyed, nor do they thrive when exposed to the open Air. The only Way, in which I have seen the young Plants succeed, was, when they were sown under Glasses, and the Surface of the Ground between the Plants was covered with Moss to keep the Ground moist, and the Glasses were constantly shaded every Day when the Sun was bright. With this Management the Plants seemed in good Health, but made little Progress in their Growth.

STOCK GILIFLOWER. See Cheiranthus.

STOEBE. Lin. Gen. Pl. 839.

The Characters are,

The Flower is composed of many hermaphrodite Florets, included in 1 common Empalement, whose Scales are Awl-shaped and permanent; between each Scale is situated 1 Floret, whose Empalement is composed of 5 narrow acute Leaves equal and erect. The Florets are Funnel-shaped, of 1 Petal cut into 5 Points at the Brim, spread open; they have 5 short Hair-like Stamina terminated by cylindrical Summits with 5 Indentures, and an oblong Germen, supporting a slender Style, crowned by a bifid acute Stigma. The Germen becomes a single Seed, crowned with a long feathery Down, sitting in the common Empalement.

We have but one Species of this Genus, viz.

STOEBE. Hort. Cliff. 390. *Stæbe*. This is the *Helichrysoides juniperi creberrimis aduncis foliis, floribus in ramulorum cymis*. Vaill. Aët. Par. 1719. Bastard Elicbrysium with crooked Juniper Leaves, and Flowers growing at the Tops of the Branches.

This Plant grows naturally at the Cape of Good Hope; it is a perennial Plant with a ligneous Stalk, which rises 2 or 3 Feet high, sending out slender Branches from the Sides, garnished with short linear Leaves, for the most part hooked; they are of a grayish Colour,

and placed irregularly round the Branches. The Flowers are produced in single Heads at the End of the Branches; they are of a pale yellow Colour, and composed of several hermaphrodite Florets, included in one common Empalement, whose Scales lie over each other like those of Fitch. The Florets are single, and peep out between the Scales of the Empalement. This Plant flowers in August, but seldom produces good Seeds in England.

It is propagated by Cuttings or Slips, which should be planted in July on a Bed of soft Loam, and covered close Down either with a Bell or Hand Glass, shading them every Day from the Sun till they have taken Root; then they must be gradually inured to the open Air, and afterward taken up, and planted in Pots, placing them in the Shade till they have taken new Root; then they may be placed in a sheltered Situation with other tender exotick Plants, and in Autumn must be removed into Shelter, for they are too tender to live through the Winter in the open Air in England.

STOECHAS. Tourn. Inst. R. H. 201. Tab. 95. *La-vendula*. Lin. Gen. Pl. 630. Cassidony, French Lavender, or Stickadore.

The Characters are,

The Flower has an oval permanent Empalement of 1 Leaf, whose Brim has some obscure Indentures; it is of the Lip Kind with 1 Petal, having a cylindrical Tube longer than the Empalement, whose Brim spreads open. The upper Lip is large, bifid, and open; the under Lip is cut into 3 roundish almost equal Segments. It has 4 Stamina within the Tube, turned aside, 2 of which are shorter than the other, terminated by small Summits, and a quadrifid Germen, supporting a slender Style the Length of the Tube, crowned by an obtuse indented Stigma. The Germen afterward turns to 4 almost oval Seeds which ripen in the Empalement. To which the following Notes must be added: The Flowers are ranged in several Series, and the Spikes are terminated by Tufts of Leaves.

The Species are,

1. **STOECHAS foliis lanceolato-linearibus, pedunculis brevioribus.** *Stæchas* with Spear-shaped linear Leaves, and shorter Foot Stalks to the Flowers. *Stæchas purpurea*. C. B. P. 216. Purple *Stæchas*, or common French Lavender.

2. **STOECHAS foliis lanceolato-linearibus, pedunculis longissimis.** *Stæchas* with Spear-shaped linear Leaves, and the longest Foot-Stalks to the Flowers. *Stæchas cauliculis non foliosis*. C. B. P. 216. *Stæchas* with Foot Stalks having no Leaves on them.

3. **STOECHAS foliis pinnato-dentatis.** *Stæchas* with Wing-indented Leaves. *Stæchas folio serrato*. C. B. P. 216. *Stæchas* with a sawed Leaf.

The 1st Sort grows naturally in the South of France and Spain, from whence the Tops or Heads of Flowers are imported to England for medicinal Use; this has a low thick shrubby Stalk, which rises about 2 Feet high, sending out ligneous Branches the whole Length, garnished with Spear-shaped linear Leaves about an Inch long, hoary and pointed, of a strong aromatick Scent, and which stand opposite on the Branches at each Joint, with smaller Leaves of the same Shape coming out at the same Places. The Branches are terminated with scaly Spikes of purple Flowers about an Inch in Length;

the Spikes are four-cornered; the Scales lie over each other like those of Fish; out of each Scale peeps one Lip Flower, whose Tube is the Length of the Scale, so the 2 Lips only appear; the under is spread open, and the upper stands erect. The Spike of Flowers is terminated by a small Tuft of purple Leaves like the Clary of *Matthiolum*; the Flowers appear in *May* and *June*, which are succeeded by oval Seeds which ripen in *August*. The whole Plant has a very strong aromatick agreeable Odour.

The Heads of Flowers of this Kind are used in some of the capital Medicines, directed by the College of Physicians, and are commonly brought from the South of *France*, where the Plants are in great Plenty, but as these are seldom imported, and very little Care taken in drying and packing them, they are very apt to take a Mouldiness in their Passage, and are not near so good for Use as those gathered fresh in *England*, where the Plants may be cultivated to great Advantage.

The 2d Sort grows naturally in *Spain*. The Difference between this and the first consists in the Foot Stalks, which sustain the Spikes of Flowers, being three Times the Length of those of the first, and naked, having no Leaves. The Spikes of Flowers are longer and not so thick, and they have more coloured Leaves on their Tops, which are longer, and of a brighter purple Colour. These Differences are not accidental, for I have many Years propagated this Plant by Seeds, and always found them the same. The Flowers, Seeds, and other Parts are the same. Of both these there are some Plants which vary in the Colour of their Flowers, some producing white, and others purplish Flowers, but the most common Colour is blue.

These Plants may be cultivated by sowing their Seeds on a Bed of light dry Soil in *March*, and when they come up, they should be carefully cleared from Weeds until they are 2 Inches high, at which Time they should be removed; therefore there must be a Spot of light dry Ground prepared, and laid level, which must be trodden out in Beds, into which the Plants should be planted at about 5, or 6 Inches Distance each Way, observing to water and shade them until they have taken Root, after which they will require no further Care, but to keep them clear from Weeds the following Summer; but, if the Winter should prove severe, it will be proper to cover them with Mats, Peas Haulm, or some other light Covering, to guard them against the Frost, which otherwise would be apt to injure them while they are so young, but in *March*, or the Beginning of *April*; the following Spring, they must be removed into the Places where they are to remain, observing, if possible, to transplant them in a warm moist Season, and not to let them remain long above Ground, for if their Roots are dried, they seldom grow well after. The Soil in which these are planted should be a dry warm Sand or Gravel, and the poorer the Soil is, the better they will endure the Cold of the Winter, provided the Ground be dry, though indeed the Plants will thrive better in Summer on a rich moist Ground, but then they will not produce so many Flowers, nor will the Heads or Spikes have near so strong an aromatick Scent.

They may also be propagated by planting Slips or Cuttings of any of the Kinds in the Spring, observing

to refresh them with Water until they have taken Root, after which they may be managed as hath been directed for the Seedling Plants; but, as those Plants raised from Seeds, are much better than these, it is hardly worth while to propagate them this Way, especially since their Seeds ripen so well in this Country.

The Heads of the first Sorts may be gathered for Use when the Flowers are in full Perfection, and spread to dry in a shady Place, after which they may be put up for Use.

The 3d Sort grows naturally in *Andalusia* in *Spain*, and also about *Murcia*; this has a ligneous Stalk, which rises 2 or 3 Feet high, furnished with Branches on every Side the whole Length, which are four-cornered and garnished with Leaves placed opposite by Pairs, which are about an Inch long, and an Eighth of an Inch broad, indented regularly on both Sides, almost to the Mid-rib, in Form of winged Leaves; they are of a grayish Colour, have a pleasant aromatick Odour and biting warm Taste. The Flowers are produced in scaly Spikes at the End of the Branches, standing on long naked Foot-Stalks; the Spikes are four-cornered, hairy, and about an Inch long, terminated by a few purplish Leaves as the other Sorts, which inclined me to keep it joined to them. It flowers great Part of Summer, but the Seeds very rarely ripen in *England*.

As this Plant seldom produces Seeds in *England*, it is propagated by Slips or Cuttings, which, if planted in *April*, and treated as those of the two other Sorts, will take Root very freely, but these Plants, when rooted must be planted in Pots, that they may be sheltered from severe Frost in Winter, because they are too tender to live in the open Air through the Winter in *England*, especially while they are young; but, when they have obtained Strength, some of them may be turned out of the Pots, and planted in a warm Situation, on a dry rubbishy Soil, where they will be stinted from growing too vigorously, so will endure the Cold much better than if they were growing in better Ground.

STONECROP. See *Sedum*.

STONECROP TREE. See *Chenopodium*.

STOVES are Contrivances for the preserving tender exotick Plants, which will not live in these northern Countries without artificial Warmth in Winter. These are built in different Methods, according to the Ingenuity of the Artist, or the different Purposes for which they are intended, but in *England* they are at present reducible to two or three.

The first is called a dry Stove, being so contrived, that the Flues through which the Smoke passes, are either carried under the Pavement of the Floor, or else are erected in the back Part of the House, over each other, and are returned six or eight Times the whole Length of the Stove, according to the Height. In these Stoves the Plants are placed on Shelves of Boards laid on a Scaffold, rising above each other like the Seats in a Theatre, for the greater Advantage of their standing in Sight, and enjoying an equal Share of Light and Air. In these Stoves are commonly placed the tender Sorts of Aloes, Cereuses, Euphorbioms, Tithymals, and other succulent Plants, which are impatient of Moisture in Winter, and require for the most part to be kept in a separate Stove, and not placed among

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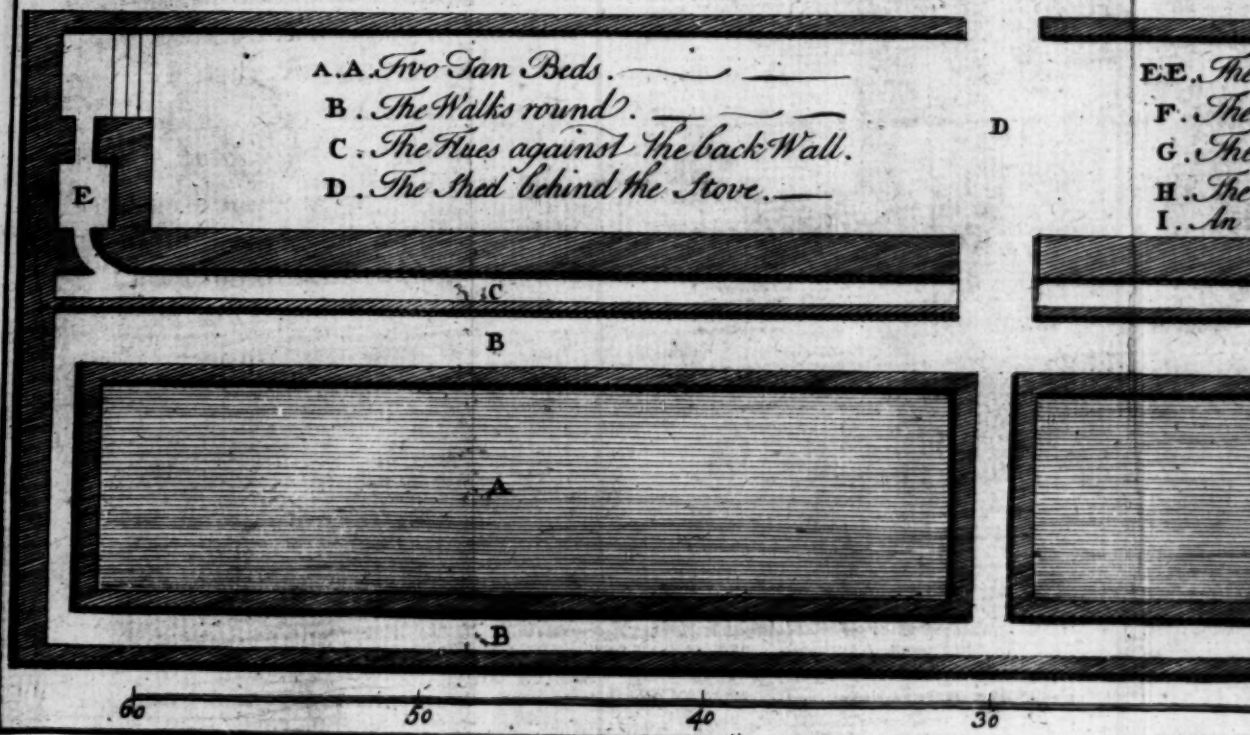
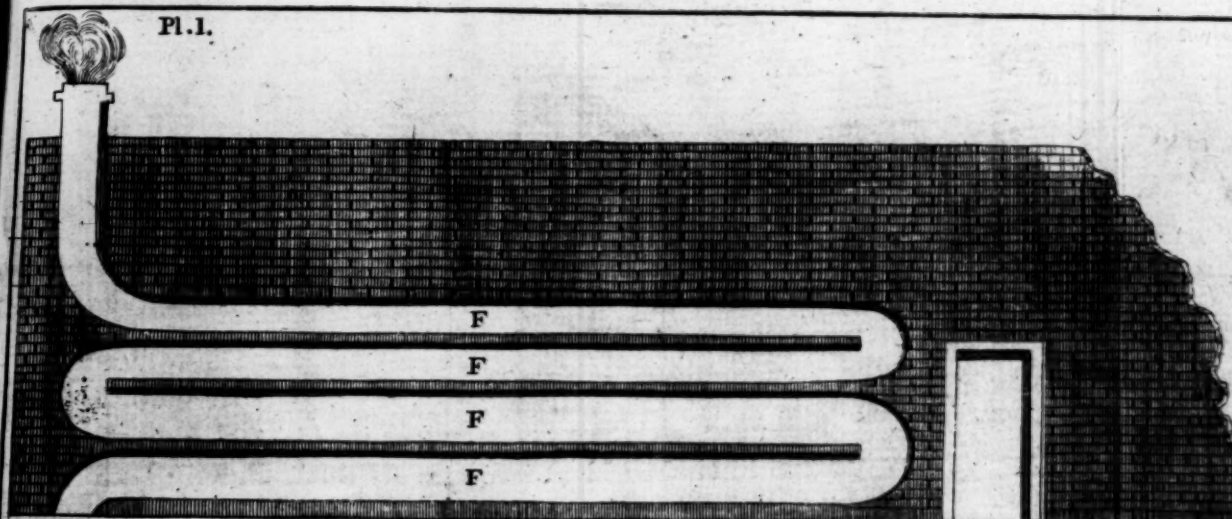
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Pl. 1.



A. A Two Tan Beds. —
 B. The Walks round. —
 C. The Hues against the back Wall.
 D. The Shed behind the Stove. —

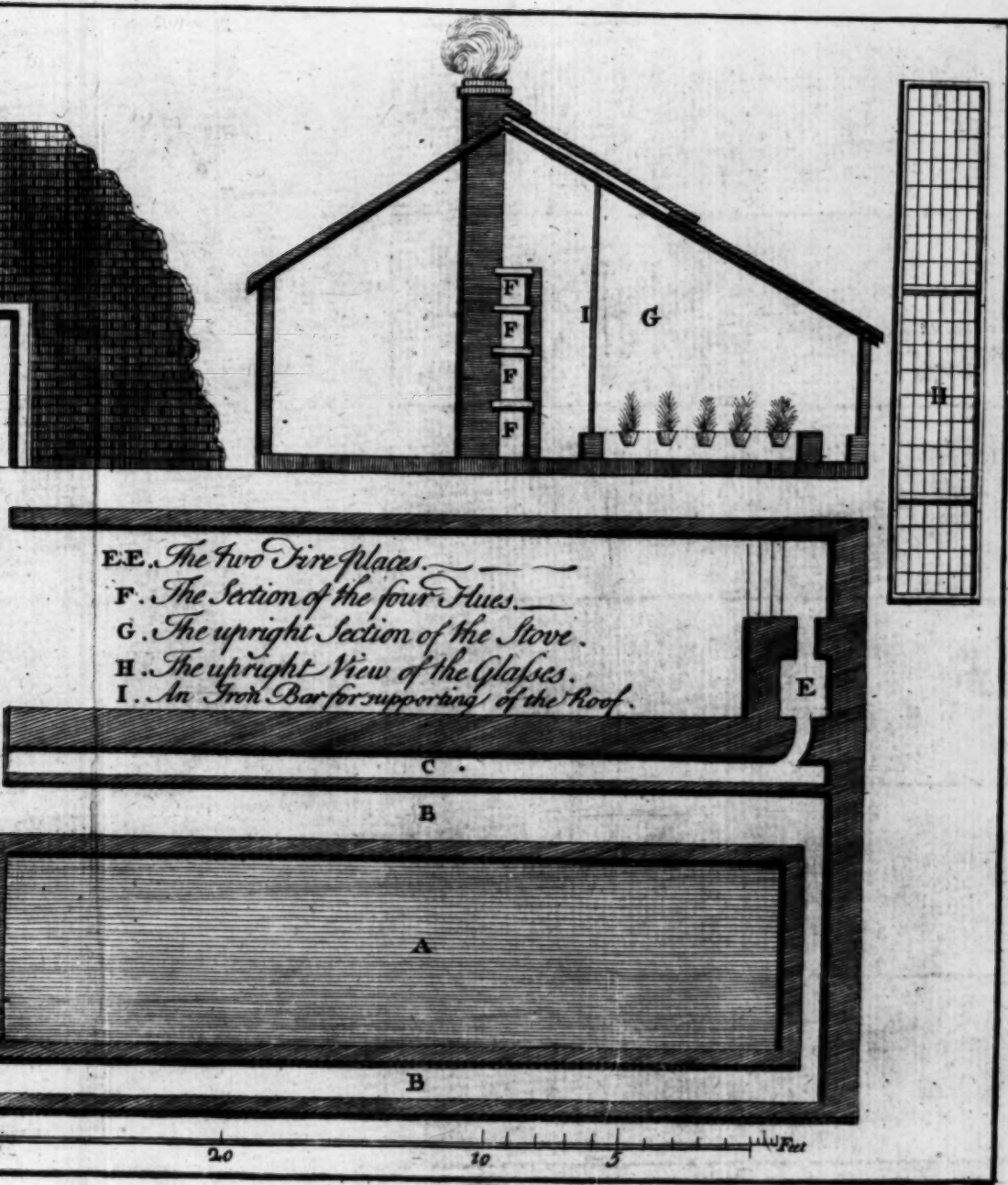
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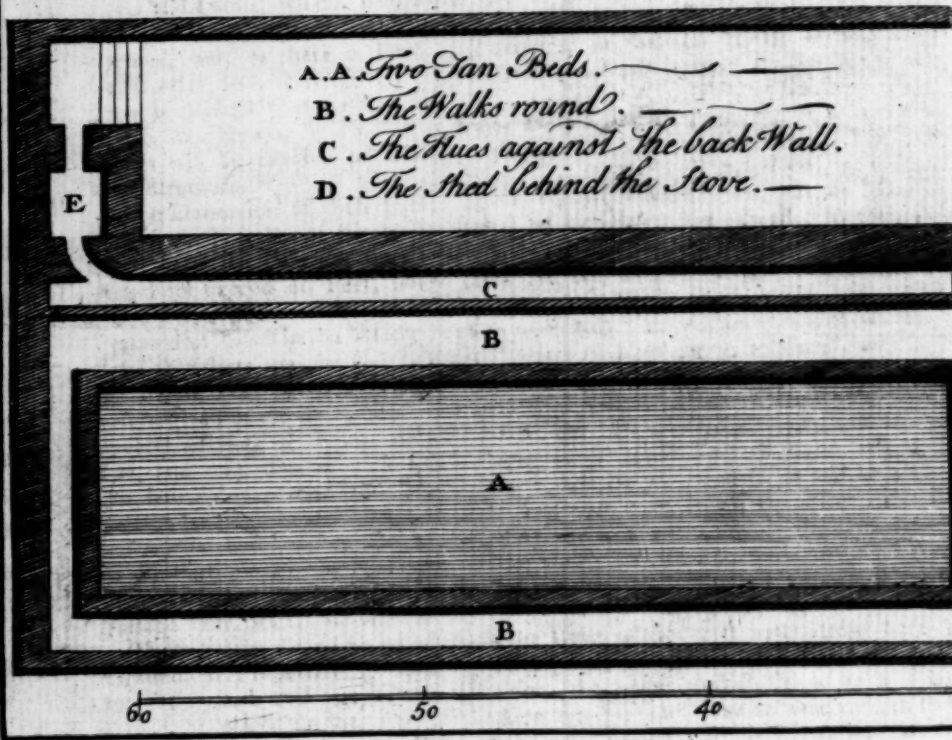
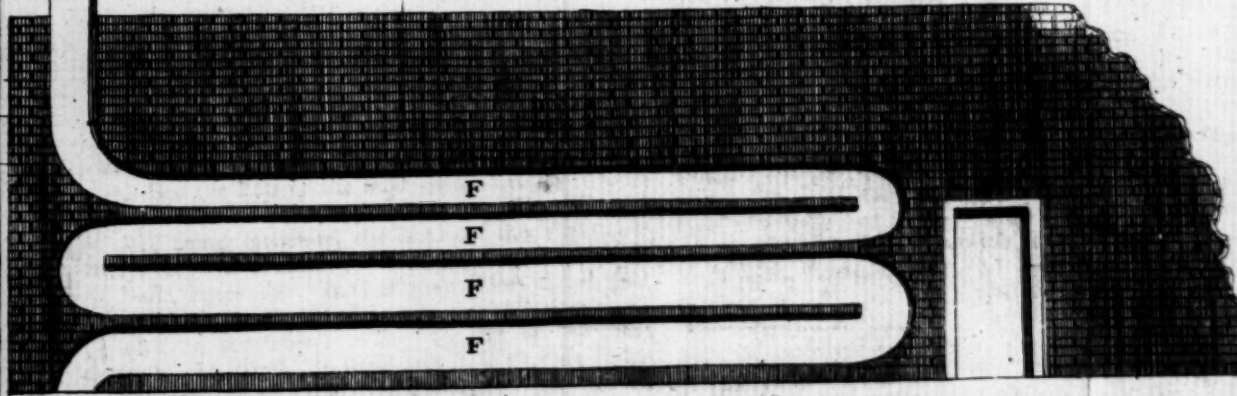
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Pl. I.



- A. A Five Tan Beds. —
B. The Walks round. —
C. The Hues against the back Wall. —
D. The Shed behind the Stove. —

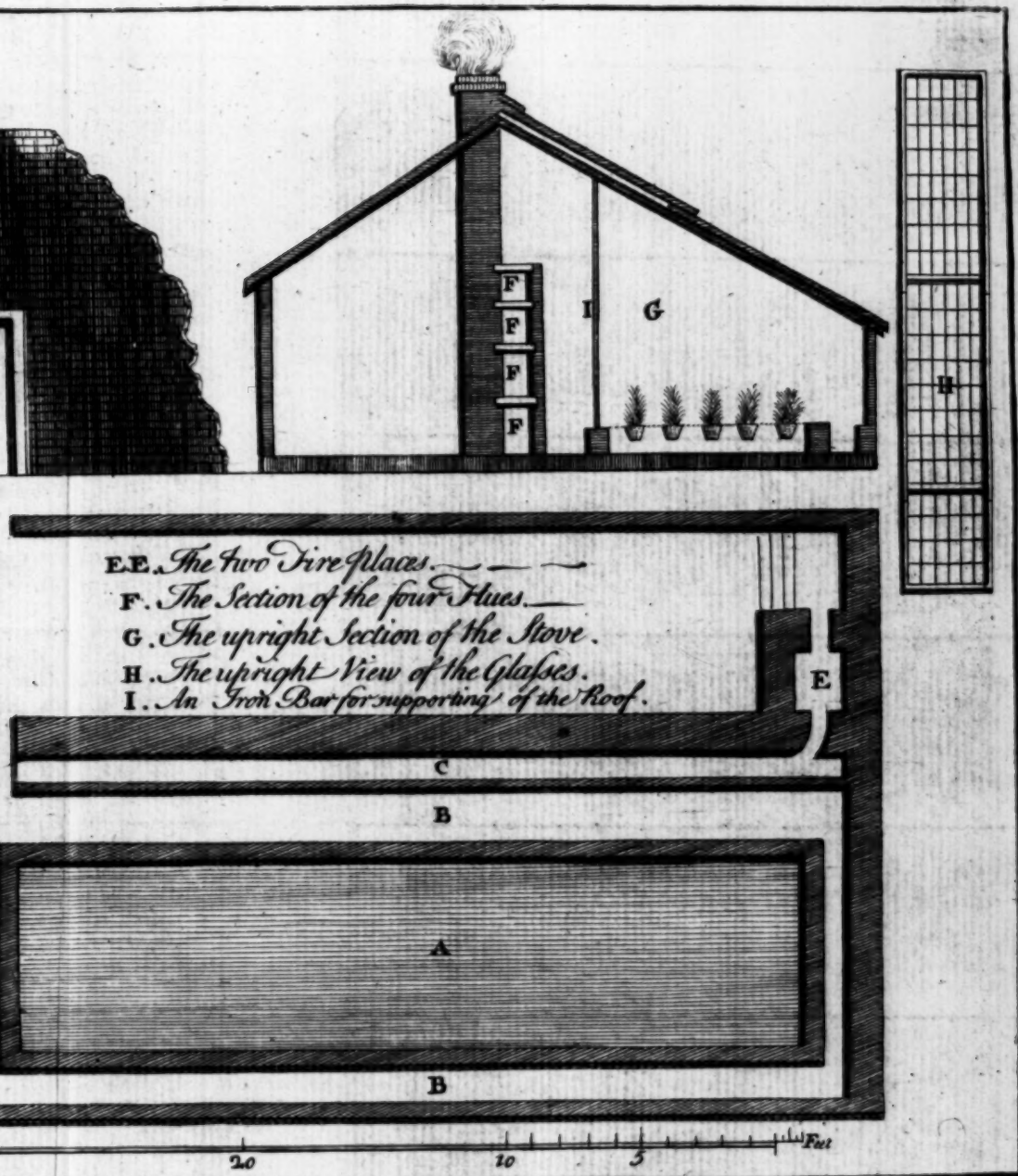
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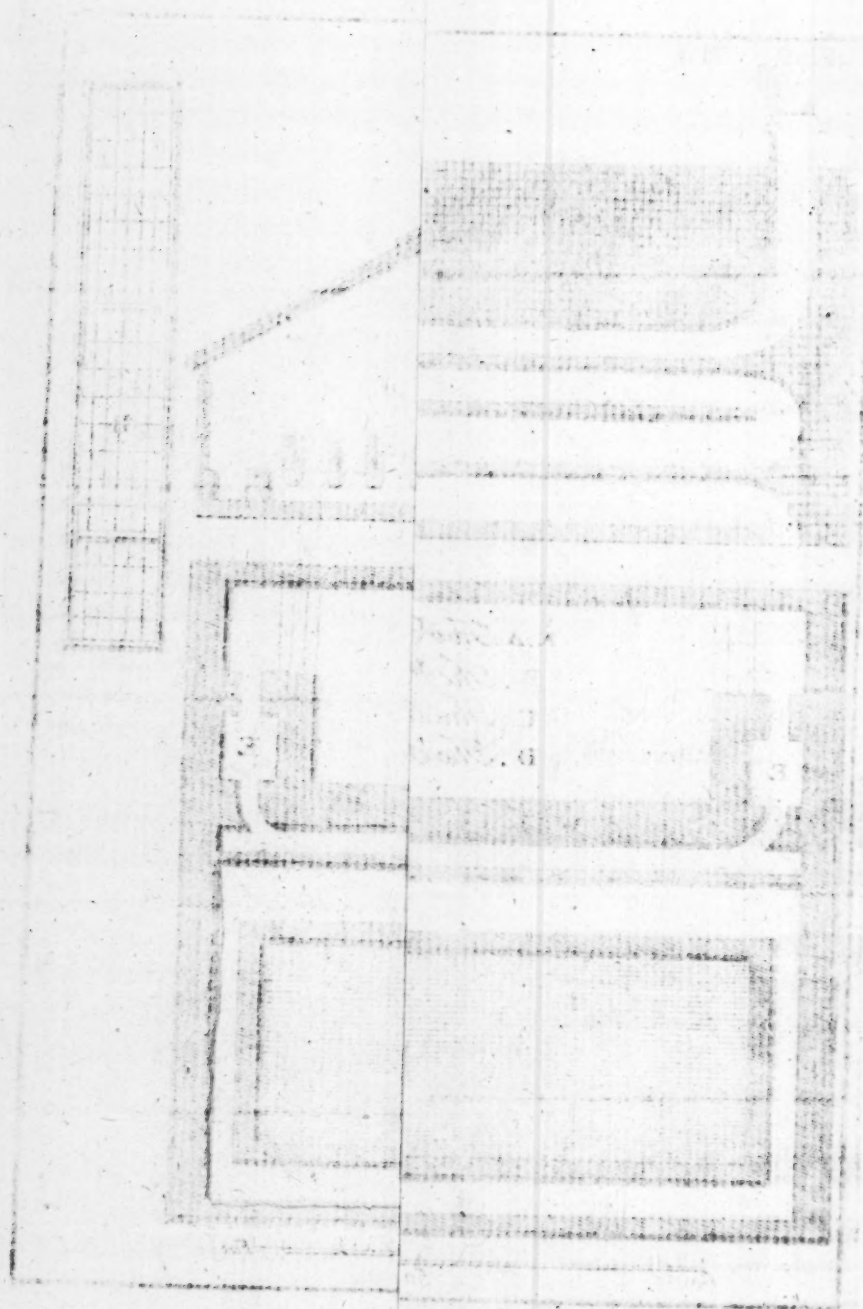
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among Trees, or herbaceous Plants, which perspire freely, and thereby often cause a damp Air in the House, which is imbibed by the succulent Plants to their no small Prejudice. These Stoves may be regulated by a Thermometer, so as not to over-heat them, nor to let the Plants suffer by Cold, in order to which all such Plants, as require nearly the same Degree of Heat, should be placed by themselves in a separate House, for if in the same Stove there are Plants Placed of many different Countries, which require as many different Heats, by making the House warm enough for some Plants, others by having too much Heat, are drawn and spoiled.

The other Sort of Stoves are commonly called Bark Stoves to distinguish them from the dry Stoves already mentioned. These have a large Pit, nearly the Length of the House, 3 Feet deep, and 6 or 7 Feet wide, according to the Breadth of the House, which Pit is filled with fresh Tanners Bark to make a hot Bed, and in this Bed the Pots of the most tender exotick Trees; and herbaceous Plants, are plunged. The Heat of this Bed being moderate, the Roots of the Plants are always kept in Action, and the Moisture, detained by the Bark, keeps the Fibres of their Roots in a ductile State, which in the dry Stove, where they are placed on Shelves, are subject to dry too fast, to the great Injury of the Plants. In these Stoves, if they are rightly contrived, may be preserved the most tender exotick Trees and Plants, which, before the Use of the Bark was introduced, were thought impossible to be kept in England, but, as there is some Skill required in the Structure of both these Stoves, I shall not only describe them as intelligibly as possible, but also annex Plans of both Stoves hereto, by which it is hoped every curious Person will be capable of directing his Workmen in their Structure.

The Dimension of these Stoves should be proportioned to the Number of Plants intended to be preserved, or the particular Fancy of the Owner, but their Length should not exceed 40 Feet, unless there are two Fire Places, and in that Case it will be proper to make a Partition of Glass in the Middle, and to have two Tan Pits, that there may be two different Degrees of Heat for Plants from different Countries (for the Reasons before given in the Account of dry Stoves,) and were I to erect a Range of Stoves, they should be all built in one, and only divided with Glass Partitions, at least the half Way toward the Front, which will be of great Advantage to the Plants, because they may have the Air in each Division, shifted by sliding the Glasses of the Partitions, or by opening the Glass Door, which should be made between each Division for the more easy Passage from one to the other.

These Stoves should be raised above the Level of the Ground, in Proportion to the Dryness of the Place, for if they are built on a moist Situation, the whole should be placed on the Top of the Ground, so that the Brick Work in Front must be raised 3 Feet above the Surface, which is the Depth of the Bark Bed, whereby none of the Bark will be in Danger of lying in Water, but, if the Soil be dry, the Brick Work in Front need not be more than 1 Foot above Ground, and the Pit may be sunk 2 Feet below the Surface. Upon the Top of this Brick Work in Front must be

laid the Plate of Timber, into which the Wood Work of the Frame is to be mortised; this should be of sound Oak without Sap, the Dimension 10 Inches wide, and 6 deep, and the upright Timbers in Front must be placed 4 Feet asunder; or somewhat more, which is the Proportion of the Width of the Glass Doors or Sashes; these should be about 6 Feet and a Half, or 7 Feet long, and placed upright; their Dimension should be 9 Inches by 6, of yellow Fir; but from the Top of these should be sloping Glasses, which should reach within 3 Feet of the Back of the Stove, where there should be a strong Crown Piece of Timber placed, in which there should be a Groove made for the Glasses to slide into; the Dimension of the sloping Timbers should be 10 Inches by 9, of yellow Fir, and the Crown Plate 1 Foot by 9 or 10 Inches of the same Timber. The Wall in the back Part of the Stove should be at least 13 Inches thick, but 18 or 22 Inches, which is two Bricks and a Half, will be better, for the greater Thickness there is in the Back Wall, the more Heat will be thrown to the Front, whereby the Air of the Stove will be better warmed, and the Building will be so much stronger, for to this Back Wall the Flues, through which the Smoke is to pass, must be joined. This Back Wall should be carried up about 16 Feet high or more for tall Stoves, that they may be of a proper Height to support the Timbers of the Back Roof which covers the Shed behind the Stove. This Roof is fastened into the Crown Piece before-mentioned, which in tall Stoves should be about 30 Feet above the Surface of the Tan Bed, which will give a sufficient Declivity to the sloping Glasses to carry off the Wet, and be of a reasonable Height for containing many tall Plants. The Back Roof may be slated, covered with Lead, or tiled, according to the Fancy of the Owner, but the Manner of the outside Building is better expressed by the annexed Plan, than is possible to be described in Words.

In the Front of the House, before the Tan Bed, there should be a Walk, about 2 Feet wide, for the Convenience of walking; next to which the Bark Pit must be placed, which should be in Width proportionable to the Breadth of the House. If the House is 14 Feet wide, which is a due Proportion, the Pit may be 8 Feet wide, and behind the Pit should be a Walk 2 Feet wide, to pass in order to water the Plants, &c. then there will be 2 Feet left next the Back Wall, to erect the Flues, which must be all raised above the Level of the Bark Bed. These Flues ought to be 1 Foot wide in the Clear, that they may not be too soon stopped with the Soot, as also for the more conveniently cleaning them; the lower Flue into which the Smoke first enters from the Fire should be two Feet deep in the Clear; this should be covered with broad Tiles, which should be a Foot and a Half square, that they may be wide enough to extend over the Wall in Front of the Flues, and to take sufficient Hold of the Back Wall; over this the second Flue must be returned back again, which may be 18 Inches deep, and covered on the Top as before, and so in like Manner the Flues may be returned over each other 6 or 8 Times, that the Heat may be spent before the Smoke passes off. The Thickness of the Wall in Front of these Flues need

need not be more than 4 Inches, but it must be well-jointed with Mortar, and pargitered within Side to prevent the Smoke from getting into the House, and the Outside should be faced with Mortar, and covered with a coarse Cloth, to keep the Mortar from cracking, as is practised in setting up Coppers. If this be carefully done, there will be no Danger of the Smoke entering the House, which cannot be too carefully guarded against, for there is nothing more injurious to Plants than Smoke, which will cause them to drop their Leaves, and, if it continue long in the House, will entirely destroy them.

The Fire Place must be made at one End, where there is but one; but, if the Stove is so long as to require two, they should be placed at each End of the Shed, which must be made the Length of the Stove, that the Fires and the Back of the Flues may not suffer from the outer Air, for it will be impossible to make the Fires burn equally, where the Wind has full Ingress to it, and it will be troublesome to attend the Fire in wet Weather, where it is exposed to the Rain.

The Contrivance of the Furnace must be according to the Fuel which is designed to burn, but as Turf is the cheapest Firing for Stoves, where it can be had, many prefer it, because it lasts longer than any other Sort of Fuel, and so requires less Attendance, I shall describe a proper Sort of Furnace for that Purpose.

The Whole of this Furnace should be erected within the House, which will be a great Addition to the Heat, and the Front Wall on the Outside of the Fire Place, next the Shed, should be 3 Bricks thick, the better to prevent the Heat from coming out that Way. The Door of the Furnace, at which the Fuel is put in, must be as small as conveniently may be to admit the Fuel; and this Door should be placed near the upper Part of the Furnace, and made to shut as close as possible, so that there may be but little of the Heat pass off through it. This Furnace should be about 20 Inches deep, and 16 Inches square at Bottom, but may be sloped off on every Side, so as to be 2 Feet square at the Top, and under this Furnace should be a Place for the Ashes to fall into, which should be about a Foot deep, and as wide as the Bottom of the Furnace; this should also have an Iron Door to shut as close as possible, but just over the Ash Hole, above the Bars which support the Fuel, should be a square Hole about 4 or 6 Inches wide to let in Air to make the Fire burn; this must also have an Iron Frame, and a Door to shut close when the Fire is perfectly lighted, which will make the Fuel last longer, and the Heat will be more moderate.

The Top of this Furnace should be nearly equal to the Top of the Bark Bed, that the lowest Flue may be above the Fire, so that there may be a greater Draught for the Smoke, and the Furnace should be arched over with Bricks. The best Materials for this Purpose are what the Bricklayers call *Wind* for Bricks, which should be laid in Loam of the same Kind as that the Bricks are made with, and this, when burnt by Fire, will cement the Whole together, and become like one Brick, but you should be very careful, where-ever the Fire is placed, that it be not too near the Bark Bed, for the Heat of the Fire will, by its long Continuance, dry the Bark, so

that it will lose its Virtue, and be in Danger of taking Fire to prevent which, it will be the best Method to continue a Hollow, between the Brick Work of the Fire and that of the Pit, about 8 Inches wide, which will effectually prevent any Damage arising from the Heat of the Fire nor should there be any Wood Work placed near the Flues, or the Fire Place because the continual Heat of the Stove may in Time dry it so much, as to cause it to take Fire, which ought to be very carefully guarded against.

The Entrance into this Stove should be either from a Green-house, the dry Stove or else through the Shed where the Fire is made, because in cold Weather the Front Glasses must not be opened. The Inside of the House should be clean white-washed, because the whiter the Back Part of the House is, the better it will reflect the Light, which is of great Consequence to Plants, especially in Winter, when the Stove is obliged to be shut up close.

Over the Top sliding Glasses there should be either wooden Shutters, or Tarpaulins fixed in Frames, to cover them in bad Weather, to prevent the Wet from getting through the Glasses, and to secure them from being broken by Storms and Hail, and these outer Coverings will be very serviceable to keep out the Frost, and if in very severe Cold there is a Tarpawlin hung before the upright Glasses in the Front, it will be of great Service to the Stove, and much less Fire will preserve a Heat in the House.

In the warmest of these Houses or Divisions should be placed the most tender exotic Trees and Plants; a List of which followeth:

Acajou, or Cashew,	Flower Fence of <i>Barbadoes</i> ,
Ahouai,	Fustick Tree,
Allegator Pear,	Ginger,
Allspice, or Pimento,	Guaiacum,
Arrow Root,	Logwood,
Bananas,	Macaw Tree,
Bastard Cedar of <i>Barbadoes</i> ,	Mamee Tree,
Bastard Locust of <i>Barbadoes</i> ,	Mancinel Tree,
Bully Tree,	Mimosa, or Sensitive Plants,
Button Wood of <i>Barbadoes</i> ,	Nickar Tree, or Bonduc,
Cabbage Tree,	Palm Trees of several Sorts,
Cocoa Tree,	Papaw Tree,
Calibash Tree,	Plantane Tree,
Cassada,	Plum Tree of <i>Jamaica</i> ,
Cedar Tree of <i>Barbadoes</i> ,	Hog Plum,
Cherry Tree of <i>Barbadoes</i> ,	Sapotilla Tree,
Cocoa Nut Tree,	Santa Maria,
Cortex Winteranus,	Sour Sop,
Custard Apple,	Sugar Apple,
Date Tree,	Sweet Sop,
Dumb Cane,	Tamarind Tree,
Fiddle Wood,	Tulip Flower, or White-
Fig Tree, the Arched <i>Indian</i> ,	wood.

These with most other Sorts of Trees, Shrubs, and herbaceous Plants, which are Natives of very warm Countries, should be plunged in the Bark Bed for the Reasons already assigned, and over the Flues may be a Convenience made to set the Melon Thistle, the tender Sorts of Cereuses, and Euphorbiums, with other very tender succulent Plants, which require to be kept dry in Winter.

As in this Stove are placed the Plants of the hottest Parts of the *East* and *West-Indies*, the Heat should be kept up equal to that marked *Anana* upon the Botanical Thermometers, and should never be suffered to be above 8 or 10 Degrees cooler at most, nor should the Spirit be raised above 10 Degrees higher in the Thermometer during the Winter Season, both which Extremes will be equally injurious to the Plants.

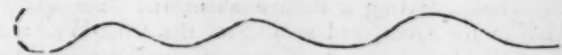
But in order to judge more exactly of the Temper of the Air in the Stove, the Thermometer should be hung at a good Distance from the Fire, nor should the Tube be exposed to the Sun, but on the contrary, as much in Shade as possible, because, whenever the Sun shines upon the Ball of the Thermometer but one single Hour, it will raise the Liquor in the Tube considerably, when perhaps the Air of the House is not near so warm, which many Times deceives those who are not aware of this.

In the Management of the Plants placed in the Bark Bed, there must be a particular Regard had to the Temper of the Bark, and the Air of the House, that neither be too violent; as also to water them frequently, but sparingly, in cold Weather, because when they are in continual Warmth, which will cause them to perspire freely, if they have not a proper Supply to answer their Discharge, their Leaves will decay, and soon fall off. As to the farther Directions concerning the Culture of the particular Plants, the Reader is desired to turn to their several Articles, where they are distinctly treated of.

The other Sort of Stove, commonly called the dry Stove, as was before said, may be either built, with upright and sloping Glasses at the Top, in the same Manner, and after the same Model of the Bark Stove, which is the most convenient; or else the Front Glasses, which should run from the Floor of the Cieling, may be laid sloping, to an Angle of 45 Degrees, the better to admit the Rays of the Sun in Spring and Autumn. The latter Method has been chiefly followed by most Persons who have built these Sorts of Stoves, but were I to have the Contrivance of a Stove of this Kind, I would have it built after the Model of the Bark Stove, with upright Glasses in Front, and sloping Glasses over them, because this will more easily admit the Sun at all the different Seasons, for in Summer, when the Sun is high, the Top Glasses will admit the Rays to shine almost all over the House, and in Winter, when the Sun is low, the Front Glasses will admit its Rays; whereas, when the Glasses are laid to any Declivity in one Direction, the Rays of the Sun will not fall directly thereon above a Fortnight in Autumn, and about the same Time in Spring, and during the other Parts of the Year they will fall obliquely thereon, and in Summer, when the Sun is high, the Rays will not reach above five or six Feet from the Glasses, for the Proof of this see Article *Sun*. Besides, the Plants, placed toward the Back Part of the House, will not thrive in the Summer Season for Want of Air, whereas when there are sloping Glasses at the Top, which run within four Feet of the Back of the House; these, by being drawn down in hot Weather, will let in perpendicular Air to all the Plants, and of how much Service this is to all Sorts of Plants, every one who has had Oppor-

tunity of observing the Growth of Plants in a Stove, will easily judge, for when Plants are placed under Cover of a Cieling, they always turn themselves toward the Air and Light, and thereby grow crooked; and if in order to preserve them strait, they are turned every Week, they will nevertheless grow weak, and look pale and sickly, for which Reasons, I am sure, whoever has made Trial of both Sorts of Stoves, will readily join with me to recommend the Model of the Bark Stove for every Purpose.

As to the farther Contrivance of this Stove, it will be necessary to observe the Temper of the Place, whether the Situation be dry or wet; if it be dry, then the Floor need not be raised above 2 Feet above the Level of the Ground, but if it be wet, it will be proper to raise it 3 Feet, especially if these Flues are to be carried under the Floor, for when they are erected close upon the Surface of the Ground, these will raise a Damp, which will prevent the Flues drawing so well as when they are more elevated. The Furnace of this Stove must be placed at one End of the House, according to the Directions before given. This must be made according to the Fuel intended to burn, which, if for Coals or Wood, may be made according to the common Method for Coppers, but only much larger, because, as the Fire is to be continued in the Night chiefly, if there is not Room to contain a proper Quantity of Fuel, it will occasion a great deal of Trouble in tending upon the Fire in the Night, which should be avoided as much as possible, because, whenever the Trouble is made very great or difficult, and the Person, who is intrusted with the Care of it, has not a very great Affection for the Thing, and is withal not very careful, there will be great Hazard of the Fire being neglected, which in a little Time may be of dangerous Consequence to the Plants; but, if the Fuel intended be Turf, then the Contrivance of the Furnace may be the same as for the Bark Stove already mentioned. The Flues of this Stove, if they are carried under the Pavement, may be turned after the following Manner,



which will cause them to draw better than if strait, and by this Method of disposing them, they may be so much turned as to reach from the Back to the Front of the House.

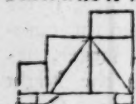
The Depth of them should not be less than 18 Inches, and the Width nearly equal, which will prevent their being choked up with Soot, as is often the Case when the Flues are made too small. The Spaces between the Flues should be filled up either with dry Brick Rubbish, Lime, or Sand, from which there will little Moisture arise, and the Flues should be closely plaistered with Loam both within and without, and the upper Part of them covered with a coarse Cloth under the Floor to prevent the Smoke from getting into the House.

When the Flue is carried from the Furnace to the End of the House, it may be returned in the Back above the Floor twice in strait Lines, which may be contrived to appear like a Step or two, by which Means

the

the smoke will be continued in the House until all its Heat is spent, which will consequently warm the Air of the House the better, and the Chimneys, through which the Smoke is to pass off, may be either at both Ends, or in the Middle, carried up in the Thickness of the Brick Work of the Flues, so as not to appear in Sight in the House. The Flues should be first covered with broad Tiles, and then a Bed of Sand laid over them about two Inches thick, upon which the plain Tiles should be laid to correspond with the rest of the Floor. This Thickness of Cover will be full enough to prevent the too sudden Rise of the Heat from the Flues.

But if the Furnace is placed under the Floor, the Thickness of the Sand between the Brick Arch that covers it and the Floor, should not be less than four or six Inches; so that the Bottom of the Furnace should be sunk the lower; and if from the Fire place to the End of the House, the Flues are laid a little rising, it will cause them to draw the better; but this Rise must be allowed in the placing them lower under the Floor next the Fire, because the Floor must be laid perfectly level, otherwise it will appear unsightly.



In this Stove there should be a Stand or Scaffold erected for placing Shelves above each other, in the Manner annexed, that the Plants may be disposed above each other; so as to make a handsome Appearance in the House; but these Shelves should be made moveable, so as to be raised or sunk, according to the various Heights of the Plants; otherwise it will be very troublesome to raise or sink every particular Plant, according to their Heights, or every Year as they advance in their Growth.

In placing the Feet of this Stand, you must be careful not to set them too near the Fire, nor directly upon the Top of the Flue, especially that End next the Fire, least by the constant Heat of the Tiles the Wood should take Fire, which cannot be too much guarded against; since such an Accident would go near to destroy all the Plants, if the House escaped being burnt. This Stand or Scaffold should be placed in the Middle of the House, leaving a Passage about two Feet and a Half in the Front, and another of the same Width in the Back, for the more conveniently passing round the Plants to water them; and that the Air may freely circulate about them. In disposing the Plants, the tallest should be placed backward, and the smallest in Front; so that there will not be Occasion for more than five or six Shelves in Height at most; but the Scaffold should be so contrived, that there may be two or three Shelves in Breadth laid upon every Rise whenever there may be Occasion for it, which will save a deal of Trouble in disposing of the Plants.

In the Erection of these Stoves, it will be of great Service to join them all together with only glass Partitions between them, as was before observed; and where several of these Stoves and Green-houses are required in one Garden, then it will be very proper to have the Green-house in the Middle, and the Stoves at each End, either in the Manner directed in the Plan of the Green-house exhibited in that Article, or carried on in one strait Front.

By this Contrivance in the Structure of these Houses, a Person may pass from one to the other of them, without going into the open Air; which, besides the Pleasure to the Owner, is also of great Use, because there will be no Occasion of making a Back-way into each of them, which otherwise must be, since the Front Glasses of the Stove should not be opened in cold Weather, if it can possibly be avoided on any Account, otherwise the cold Air rushing in, will greatly prejudice the very tender Plants.

But besides the Stoves here described, and the Green-house, it will be very necessary to have a Glass Case or two where-ever there are great Collections of Plants. These may be built exactly in the Manner already described for the Stoves, with upright Glasses in Front, and sloping Glasses over the Top of them, which should run within four Feet of the Back of the House. The Height, Depth, and other Dimensions, should be conformable to that of the Stoves, which will make a Regularity in the Building. These may be placed at the End of the Range on each Hand beyond the Stoves; and if there be a Flue carried along round each of these, with an Oven to make a Fire in very cold Weather, it will save a great deal of Labour, and prevent the Frost from ever entering the House, be the Winter ever so severe; but the upper Glasses of these Houses should have either Shutters of Wood, or Tarpaulins in Frames to cover them in frosty Weather; and if there is a Contrivance to cover the upright Glasses in Frost, either with Mats, Shutters, or Tarpaulins, it will be of great Use in Winter, otherwise the Flue must be used when the Frost comes on; which should not be done, but upon extraordinary Occasions; because the Design of these Houses is, to keep such Plants as require only to be preserved from Frost, and need no additional Warmth; but at the same Time, require more Air than can conveniently be given them in a Green-house. In one of these Houses may be placed all the Sorts of Ficoides, *African Sedums*, *Cotyledons*, and other succulent Plants from the *Cape of Good Hope*. In the other may be placed the several Kinds of *Arctotis*, *Osteospermum*, *Royena*, *Lotus*, and other woody or herbaceous Plants from the same Country, or any other in the same Latitude.

Thus by contriving the Green-house in the Middle, and one Stove and a Glass Case at each End; there will be a Conveniency to keep Plants from all the different Parts of the World, which can be no otherwise maintained but by placing them in different Degrees of Heat, according to the Places of their native Growth.

The Stoves before described are such as are usually built to maintain exotick Plants, which will not live in *England*, unless they enjoy a Temperature of Air, approaching to that of the several Countries from whence they are brought; therefore, whoever is inclinable to preserve a large Collection of Plants from different Countries, must contrive to have two or three of these Stoves, each of which should be kept in a different Temperature of Warmth; and the Plants should be also adapted to the several Degrees of Heat, as they shall require to preserve them; but for the better Information of those Persons, who are not conversant in this Business, there is a List of Plants added by way of Appendix to this; in which the Plants are ranged, according

according to the different Degrees of Heat which they require in this Country; to which the Reader is desired to turn, for his further Information; and as the far greatest Number of Stoves, which have been erected in *England*, are designed for the Culture of the Ananas only: so I shall add a Description and Plans of two Sorts of Stoves, of the least Expence in building for this Purpose; so that whoever is inclinable to erect a Stove for ripening the Ananas, may, by attending to the Plans and Descriptions, direct the building and contriving such Stoves as they are desirous to have; or according to the Number of Fruit proposed to be ripened annually.

The first Sort of Stove is that which is designed for the Plants which produce the Fruit the same Year; for as the Plants do not generally fruit, until the second Year from their being taken from the old Plants, whether they are Suckers from the Side of the Plants, or Crowns taken from the Fruit, if they fruit the succeeding Year, the Fruit will be small; therefore, when they are properly managed, they will not produce their Fruit until the second Year; by which Time they will have obtained Strength to produce large Fruit, in which their greatest Value consists; for although, there are several Varieties of this Fruit, which differ in Degrees of Goodness, as in most other Fruits; yet they may all of them be improved in their Size, without diminishing their Excellence in Taste; though I know there are some Persons of a contrary Opinion, and who believe, that the small Fruit are always better flavoured than the large; but from long Experience I can assert, that the larger and better nourished this Fruit is, the higher will be its Flavour, supposing the Sorts are the same; therefore every Person who cultivates this Fruit, should endeavour to have it improved to the greatest Perfection; in order to which it will be proper to have a small Stove, in which the young Plants may be placed to bring them forward for fruiting; and the following Autumn they should be removed into the larger Stove for ripening: But I shall return to the Description of the larger Stove. The Length of this must be proportionable to the Quantity of Fruit desired in one Season; for as to their Width, that should not be much varied; the Tan Bed should never be narrower than six, nor should it be more than seven Feet wide, for when it is more, there will be Difficulty in reaching those Plants which are in the Middle of the Bed, to water or clean them, and if there is Room enough on each Side of the Bed for a Walk, a Foot and a Half broad, it will be sufficient for Persons to water and do every Thing which is necessary to the Plants; and as these Places are not designed for walking in, so it is to no Purpose to have broad Walks, which will take up too much Space; and the Fires must be larger, in Proportion to the Space of the House; otherwise the Air cannot be kept in a proper Temperature of Warmth. If the Stove is made 36 Feet long in the Clear, then the Tan Bed may be thirty three Feet long and a Walk left at each End a Foot and a Half wide; which will be sufficient to walk round the Bed to water and attend the Plants; and such a Tan Bed will contain eighty fruiting Plants very well if the Bed is seven Feet wide; and this Stove

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may be very well warmed with one Fire; but if the Stove is built much larger, there must be two Fire Places contrived, one at each End, otherwise the Air of the House cannot be kept in a proper Temperature of Heat. The Quantity of Fuel which will be wanting for a Stove of thirty-six Feet long in the Clear, is about three Chaldron and a Half of Coals, or in such Proportion for any other Sort of Fuel; when Coals can be had reasonable it is the best Kind of Fuel; and the Pit or Scotch Coal is preferable to the Newcastle Coal, because the latter is very subject to melt or run into Clinkers, when the oven is very hot, which the Pit Coal never does, but always burns away with a white Ash, making but little Soot; so that the Flues will not require to be so often cleaned, as when the other Coal is used. The next best Fuel for Stoves is Peat, where it can be procured good, but the Scent of this Fuel is disagreeable to many People. There are some Persons who burn Wood in their Stoves, but this Fuel requires much greater Attendance than any other, therefore is not very proper for this Purpose; but in the building of the Stoves, the Ovens must be contrived for the Sort of Fuel which is to be used in them; but these will be afterwards described, and the Places where they should be situated, are delineated in the Plan.

The Stoves designed for ripening the Fruit of the Ananas should have upright Glasses in their Front, which should be high enough to admit a Person to walk upright under them on the Walk in the Front of the House; or where this cannot be admitted, the Front Walk may be sunk one Foot lower than that on the Back of the Tan Bed, so that the Surface of the Bed will be a Foot above the Walk, which will be rather an Advantage, as the Plants will be so much nearer the Glass; and a Person may with great Ease water and attend the Plants, when they are thus raised above the Walk; therefore, when a Stove is so situated, as that the raising of it high above Ground, might be attended with Inconvenience, the Walks quite round the Tan Bed may be sunk a Foot or 18 Inches below the Top of the Bed; which will admit of the Stove being built so much lower; for if there is Height for a Person to walk under the Glasses, it will be as much as is required; but as the Flues, when returned four Times against the Back Wall, will rise near 7 Feet, so the Bottom of the lower Flue should be on the same Level with the Walk, to admit Room enough for the whole under the Roof. Over the upright Glasses there must be a Range of sloping Glasses, which must run to join the Roof; which should come so far from the Back Wall as to cover the Flues, and the Walk behind the Tan Pit; for if the sloping Glasses are of Length sufficient to reach nearly over the Bed, the Plants will require no more Light; therefore these Glasses should not be longer than is absolutely necessary, which will render them more manageable; but the annexed Plan will render this more intelligible than any written Description can do.

The other Sort of Stove, which is designed for raising of young Plants, until they are of a proper Size to produce Fruit, need not be built so high as the former; therefore there will not be wanting any upright Glasses in the Front; but the Frames may be made in one

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Slope.

Slope, as in the annexed Plan; indeed of late Years, many Persons have made Tan Beds, with two Flues running through the Back Wall, to warm the Air in Winter; and these Beds have been covered with Glasses, made in the same Manner as those for common hot Beds, but larger; these were contrived to save Expence, and have in many Places answered the Intention, but to these there are several Objections. 1. That of having no Passage into them; so that the Glasses must be taken off, when the Plants want Water, &c. 2. The Damps very often rise in the Winter Season, when the Glasses are closely shut, which often proves very injurious to the Plants. 3. There is Danger of the Tan taking Fire, where there is not great Care taken that it doth not lie near the Flues; so that although the small Stoves here proposed require more Expence in their building, yet, being greatly preferable to those Pits, and the after Expence being the same, they will be found so much more convenient as to render them more general where this Fruit is cultivated.

Where there is no Danger of the Wet settling about the Tan in Winter, the Bark Pit may be sunk 2 Feet deep in the Ground, and raised one Foot above the Surface; the only Walk which is necessary in these Stoves, is that on the Back of the Tan Bed, which may be on the Level with the Surface of the Ground, so that the Tan Bed will be more than one Foot, above the Walk, and the Flues beginning from the Level of the Walk there will be Room to return them three Times; which will warm the Air much more, with the same Fire, than when they are carried but twice the Length of the Stove.

But in wet Land the Tan Bed should be wholly raised above the Level of the Ground, in order to preserve the Tan from being chilled by Moisture; and in such Places the Walk on the Back should be raised near two Feet above the Level of the Ground; because the Tan Bed should not rise much more than one Foot above the Walk; for if it is higher, it will be more difficult to reach the Plants when they require Water; the Brick Wall of the Pit, on the Side next the Walk, need not be more than four Inches thick, so far as rises above the Walk; but below that, it should be nine Inches thick; The Reason for reducing the Wall above, is to gain Room for the Walk, which would otherwise be too much contracted; and if there is a Kirb of Oak laid on the Top of the four Inch Wall, it will secure the Bricks from being displaced, and sufficiently strengthen the Wall; which being but one Foot above the Walk, will not be in any Danger of falling; and on this Kirb there may be two or three upright Iron Bars fixed with Claws, to support the Crown Piece of Timber, which will secure it from hanging in the Middle, which in a great Length, is very often the Case, where there are no Supports placed under it; there may be more or less of these Bars according to the Length of the Stove; but if they are about ten Feet asunder, it will be near enough. If these Iron Bars are one Inch square, they will be strong enough to answer the Design.

But as it is hoped that the annexed Plan of this small Stove will convey a clear Idea of the whole Contrivance;

this will render it unnecessary to add any farther Description here,

An Explanation of the Plate which represents the two Sorts of Frames with oiled Paper for covering Melons.

The first of these Frames is contrived like the Covers of Waggon; it has a Frame of Wood at the Base, to which are fastened broad Hoops which are bent over circularly as is represented at Fig. 1. The Width of this Frame should be from five to six Feet for less than five Feet will not be sufficient to cover the Bed, and if they are more than six Feet broad, they will be too heavy and troublesome to move. *a* Shews the Section of the Width, *b* the Frame of Wood at the Base, *c* the Arch of Hoops, and *d* a small Slip of Wood which is fastened to the under Side of the Hoops to keep them in their proper Position.

The Distance between each Hoop should not be more than one Foot, and there should be two Rows of strong Packthread or Rope Yarn on each Side of the Arch running from Hoop to Hoop at the Places marked, *e. e. e. e.* to keep the oiled Paper from sinking down with Wet. The Length of each Frame should not be much more than 10 Feet, which will be sufficient Length for covering 3 Plants, that being about the Size of a three Light Frame; for if they are longer they will be heavy and troublesome to move; therefore there should be as many of these Frames made, as may be necessary for covering the Quantity of Plants desired. Fig. 2. represents two Lengths of these Frames joined, *G.* shews the Profile of the the Frame, and *H.* represents the Paper turned back, that it may be seen how it is laid over the Frame.

Fig. 3. Represents the other Sort of Frame which is contrived like the Roof of a House, *a* shews a Section of the Base; *b b* the two Slopes, *c* one of the Sides which is contrived to be raised at any Time to admit Air to the Plants, *d* shews the Place where this shuts down, and *e* The Prop which supports it. If in the making of these Frames every other Light is made with Hinges so as to be raised, and on the opposite Side they are contrived to rise alternately, it will be a very good Method, for then Air may be given at the Side contrary to the Wind, and in very warm Weather, when the Plants require a large Share of Air, they may all be raised on both Sides, which will make a thorough Air to the whole Bed. Fig. 4. Shews the Plain of these Frames, and Fig. 5. The same erected; *g* represents the Profile of it, and *f* the Covering of Paper. This Sort of Frame may be made of Pantile Laths, or of Slips of Deal of like Dimensions, because they should not be too heavy; but the Base of the Frame to which these are fastened, should be more substantial. Some Persons who have made Trial of both, recommend the latter for the Convenience of giving Air to the Plants, for there is no other Contrivance in the first Sort for admitting the Air, but by raising the whole Frame on one Side in Proportion to the Quantity of Air intended to be admitted, and when the Season is warm, they generally raise those Frames on both Sides and permit the Plants to run out from under them.

When these Frames are made, if they are well painted over with the following Composition, it will greatly pre-

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preserve them. viz. To every six Pounds of melted Pitch, add half a pint of Linseed Oil, and a Pound of Brick Dust; these should be well mixed together and used warm; when this dries it becomes a hard Cement, so that no Moisture can penetrate through it, and is the best Sort of Pigment for all Timber exposed to the Weather, I have ever seen used; so that where the Colour is not offensive to the Sight, it should be preferred to every other.

When the Frames are thoroughly dry, the Paper should be pasted on to the Frames. The best Sort of Paper for this Purpose, is what they call *Dutch Wrapper*; this is strong, and when oiled over becomes pellucid, so admits the Rays of Light through it extremely well. After the Paste is well dried, the Paper should be oiled over on the Outside, which if well done with Linseed Oil will be sufficient, for the Oil will soak quite through the Paper, so there will be no Necessity for oiling both Sides, nor for doing it over more than once. The Oil should be dry before the Frames are exposed to the Wet, otherwise the Paper will tear. In the pasting of the Paper on the Frames, there should be Care taken to stretch it very smooth, and also to paste it to all the Ribs of the Frames, and also to the Packthreads to prevent the Wind from raising the Paper, which would soon tear it, when it became loose.

The above Description together with the annexed Plan, it is hoped will be sufficient Instructions, for any one who is desirous of making these Covers, and what has been before mentioned under the Article *Melon*, will be Directions enough for the Use of them, so that I shall only add one Caution which may be necessary to repeat here, which is, not to keep these Covers too close down over the Plants, lest it draw them too weak, so that Air should always be admitted to the Plants at all Times in Proportion to the Warmth of the Season.

These Covers of oiled Paper, are not only useful for covering of Melons, but are the best Things to cover Cuttings of exotic Plants, when planted, that can be contrived; and are also capable of being used for many other Purposes.

The Paper will seldom last longer than one Season, so it will require a new Covering every Spring, but if the Frames are well made, and when they are out of Use, laid up in Shelter from the Wet, they will last several Years, especially if there is a Band of Straw laid round the Melons, upon which the Frames may stand, so they will not rest upon the Ground, and the Straw Bands will prevent the Damp from rising so as to rot them. These Straw Bands are such as are recommended for the hot Beds of Asparagus in Winter.

STRAMONIUM, See *Datura*

STRATIOTES *Lin. Gen. Pl. 607. Aloides, Boerb. Ind. Alt. Plant. 2. P. 172. Water Soldier.*

The Characters are,

It has 1 Flower inclosed in a compressed obtuse Sheath, composed of 2 Leaves which are keel-shaped and permanent. The Empalement of the Flower is of 1 Leaf, trifid and erect. It has 3 almost Heart-shaped Petals, twice the Size of the Empalement, erect and spreading, and about 20 Stamina inserted in the Receptacle of the Flower, terminated by single Summits. The Germen is situated under the Empalement supporting 6 Styles divided in 2 Parts,

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crowned by single Stigmas. The Germen becomes an oval Capsule narrowed on every Side having 6 Angles, and as many Cells filled with oblong incurved Seeds.

We know but one Species of this Genus, viz.

STRATIOTES. *Lin. Flor Lapp. 222. Water Soldier Water Aloe, or Fresh Water Soldier. This is the Aloe Palustris C. B. P. 280.*

This Plant is in Shape like the Aloe, but the Leaves are thinner, and serrated on the Edges very sharply; they are of a grayish Colour and about a Foot long; between the Leaves from the Center of the Plant, arise 1, 2, and sometimes 3 Stalks, almost the Length of the Leaves, each being terminated by a three forked Sheath, out of which bursts one white Flower composed of 3 roundish Heart-shaped Petals with many yellow Stamina in the Middle. Below the Flower is situated a conical Germen, reversed, the broad End standing upward, and the narrow downward. This becomes a 6 angled Capsule, having 6 Cells, filled with Seeds. It flowers in July and the Seeds ripen in September. It grows plentifully in standing Waters in the Isle of Ely, and many Places in the North of England, from whence young Plants may be procured in Spring, when they first rise on the Surface of the Water; and these being placed in large Ponds or Canals, will strike down their Roots, and propagate without any farther Care. In Autumn the Plants sink down to the Bottom of the Water, and rise again in the Spring.

STRAWBERRY. See *Fragaria*.

STRAWBERRY TREE. See *Arbutus*.

STYLE. The Style of a Flower is a Body accompanying the Germen, either arising from the Top of it, or standing as an Axis in the Middle of the Germen, and supports the Stigma, which is supposed the female Organ by which the Farina is received and conveyed to the Germen.

STYRAX. *Tourn. Inst. R. H. 598. Tab. 369. Lin. Gen. Pl. 527. Storax Tree.*

The Characters of the Genus are,

The Flower has a short cylindrical Empalement of 1 Leaf, indented in 5 Parts; it has 1 Funnel-shaped Petal, with a short cylindrical Tube the Length of the Empalement, whose Brim is cut into 5 large obtuse Segments which spread open; it has 10 or 12 Awl-shaped Stamina disposed circularly, inserted in the Petals, and terminated by oblong Summits, and a roundish Germen, supporting a single Style the Length of the Stamina, crowned by a ragged Stigma. The Germen turns to a roundish Fruit with 1 Cell including 2 Nuts, plain on 1 Side, and convex on the other.

We know but one Species of this Genus, viz.

STYRAX. *Hort. Cliff. 187. The Storax Tree. This is the Styra folio mali cotonei. C. B. P. 452. The Quince-leaved Storax Tree.*

This Plant grows plentifully in the Neighbourhood of Rome, and also in Palestine, and several of the Islands in the Archipelago, from whence the Fruit has been brought to England; where there have been many Plants raised of late Years, in some curious Gardens.

It has a woody Stalk which rises 12 or 14 Feet high; covered with a smooth grayish Bark, and sends out many slender ligneous Branches on every Side, garnished with oval Leaves about 2 Inches long, and 1 and a Half broad, of a bright green on their upper

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Side, but hoary on their under; they are entire and placed alternately on short Foot Stalks. The Flowers come out from the Side of the Branches, on Foot Stalks which sustain 5 or 6 Flowers in a Bunch; these have one very white Petal which is Funnel-shaped, the lower Part being tubulous and cylindrical, the upper Part is divided into 5 obtuse Segments, which spread open but not flat, rather inclining to an Angle. These appear in June, but are not succeeded by Berries in England.

It may be propagated by sowing the Seeds in Pots filled with fresh light Earth, and plunged into a moderate hot Bed. This should be done as soon as possible, when the Seeds are procured; for if they are sown the latter End of Summer, and the Pots kept in a moderate hot Bed of Tanners Bark all the Winter, the Plants will come up the succeeding Spring; whereas those sown in the Spring often remain in the Ground a whole Year before the Plants come up.

When the Plants are come up, they should be hardened gradually to the open Air, into which they should be removed in June, placing them in a sheltered Situation, observing to keep them clean from Weeds, and supply them with Water duly in dry Weather. In this Place they may remain till Autumn; when they should be placed under a common hot Bed Frame, where they may be screened from hard Frost in Winter, but in mild Weather enjoy the free Air as much as possible, for if they are kept too close, their Tops are very subject to grow mouldy. The Leaves of these Plants fall off in Autumn, and in the Spring before they begin to shoot, they should be shaken out of the Pots, and their Roots carefully parted, and each transplanted into a separate small Pot filled with light fresh Earth, and plunged into a very moderate hot Bed; observing to water and shade them untill they have taken Root; after which they should be inured to the open Air by Degrees, into which they must be removed in June, placing them in a warm Situation; in which Place they may remain till the End of October, at which Time they should be removed into Shelter for the Winter Season. These Plants are tolerably hardy, and only require to be sheltered from severe Frost while they are young; for in Italy they grow extremely well in the open Air, and produce Fruit in great Plenty. When the Plants have grown 3 or 4 Years in Pots, and are become strong, some of them may be turned out of the Pots, and planted in the full Ground, against a Wall to the South Aspect, to which their Branches should be trained, as is practised with Fruit Trees, in which Situation they will bear the Cold of our ordinary Winters very well; but in very severe Frost, it will be proper to cover the Branches either with Mats, Straw, or other light Covering to protect them.

The Gum of this Tree is used in Medicine, which is obtained by making Incisions in the Tree. It is brought from Turkey, but is so adulterated by mixing Saw Dust or other Stuff with it, that it is very difficult to meet with any that is pure. It has a most pleasant fragrant Odour; it is called *Styrax Calamita*, because it was transported in hollow Canes.

There is another Sort of *Storax* titled *Styrax liquida*, which is a thick tenacious Substance like Turpentine, of a reddish brown Colour. It has been much disputed

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among the Writers on the *Materia Medica*, what this is, some believing it to be the Gum or Resin of a Tree, and others thought it to be a fictitious Thing; but Mr. *Pettiver* says in the *Philosophical Transactions* No. 313 it is a Kind of Bird Lime, made of the Bark of a Tree, by boiling it in salt Water. The Tree grows on the Island of *Cubross*, at the upper End of the Red Sea near *Cadesb*, which is within 3 Days Journey of *Sues*. It is called *Rosa Mallas*, and by the Turks *Catta mija*.

Of late Years there has been another Species of *Storax* imported here from *North America* collected from the liquid Amber Tree, this has been titled liquid *Storax* by some, but is very different from that brought from Turkey, and is clear, inclining to yellow; it is brought sometimes liquid, and at others it is dried in the Sun to a concrete Resin before it is transported.

SUBER. See *Quercus*.

SUBTERRANEOUS is that which is under or within the Surface, Bowels, or Caverns of the Earth, or the hollow Places of the Earth, that are under Ground.

SUCCORY. See *Cichorium*.

SUCCULENT PLANTS are such whose Leaves are thick, and abound with Juice.

SULPHUREOUS is of a Brimstone Colour.

SUMACH. See *Rhus*.

SUMMITS, or *Apices*, are those Bodies which contain the prolific Powder, analogous to the male Sperma in Animals; these generally hang upon the *Stamina* or Threads, which surround the Ovary in Flowers.

SUPERFICIES of the Ground, &c. is the outward Part or Surface of it.

SURFACE is the bare Outside of a Body or Superficies.

SURIANA. *Plum. Nov. Gen. 37. Tab. 40. Lin. Gen. Pl. 353.*

The Characters are,

The Empalement of the Flower is permanent, and composed of 5 Spear-shaped small Leaves. The Flower has 5 oval Petals, the Length of the Empalement, which spread open; it has 5 slender *Stamina*, shorter than the Petals, terminated by single Summits, and 5 roundish *Germina* supporting a slender Style the Length of the *Stamina* which is inserted in the Middle to the Side of the *Germina* crowned with an obtuse Stigma. The *Germina* become 5 roundish Seeds joined together.

We know but one Species of this Genus, viz.

SURIANA. *Hort. Cliff. 492. Suriana*. This is the *Suriana foliis portulacæ angustis. Plum. Nov. Gen. 37. Suriana* with narrow Purslain Leaves.

This Plant was so named by Father *Plumier*, who discovered it in the French Settlements in America, in Honour of *Joseph Surian* of *Marseilles*, who was a very curious Botanist.

This grows naturally by the Sea Side in most of the Islands of the *West Indies*, where it rises with a thick shrubby Stalk, 8 or 9 Feet high, covered with a dark brown Bark, and divides into Branches, the upper Part of which are closely garnished with Leaves on every Side standing without Order; they are about an Inch long, and one Eighth of an Inch broad at the Point, growing narrower to their Base; they are rounded at their Points, and sit close to the Branches, having no Foot Stalks; they are of a dirty green Colour. From between

tween the Leaves come out the Foot Stalks of the Flowers which are about an Inch long; these do each sustain 2, 3, or 4 yellow Flowers, which have some 4, and others 5 Petals rounded at their Points, and almost Heart-shaped; these are succeeded by roundish Seeds, joined together, sitting in the Empalement. Some Flowers have 2, others 3, 4, or 5 Seeds to each.

The Seeds of this Plant were brought from the *Havanna* by the late Dr. *William Houstoun*, who found the Plants growing there in great Plenty on the Shore, in moist Places, where the Salt Water usually flows. It also grows plentifully in some Parts of the Island of *Jamaica*.

It is propagated by Seeds, which must be sown on a hot Bed early in the Spring, and when the Plants are come up they must be carefully cleared from Weeds, and frequently refreshed with Water. In warm Weather the Glasses of the hot Bed should be raised every Day, to admit fresh Air to the Plants, to prevent their drawing up too weak. When the Plants are fit to remove, they should be taken up carefully, and each planted in a separate small Pot filled with fresh light Earth, and plunged into a hot Bed of Tanner's Bark, observing to shade them untill they have taken new Root; after which Time they must be duly watered every Evening in hot Weather, and must have fresh Air admitted to them every Day in Proportion to the Warmth of the Season. In this hot Bed the Plants may remain till Autumn, when the Nights begin to be cold, at which Time they should be removed into the Stove, and plunged into the Bark Bed. During the Winter Season these Plants must be kept very warm, especially while they are young otherwise they will not live through the Winter in this Country. They must also be frequently refreshed with Water; but it must not be given to them in large Quantities in cold Weather; for too much Moisture in Winter will soon destroy them. These Plants make but slow Progress the first Year; afterwards they will grow pretty freely, if they are not stinted. In Winter they must constantly be kept in the Stove in this Country, and if they are plunged into the Bark Bed, they will make the greater Progress. In Summer they must have a large Share of Air by opening the Glasses of the Stoves; and if their Leaves are covered with Filth (which the Plants in Stoves often contract), they should be carefully washed with a Sponge; otherwise the Plants will not only appear unsightly, but it will retard their Growth.

SYCAMORE. See *Acer majus*.

SYMPHYTUM. *Tourn. Inst. R. 138. Tab. 56. Lin. Gen. Pl. 170.* Comfrey; in French, *Consoud*.

The Characters are,

The Flower has a five-cornered, erect permanent Empalement, cut into 5 acute Parts; it has 1 Petal with a short Tube, above which the Limb has a swelling Belly and thicker Tube; the Brim is indented in 5 obtuse Parts reflexed; the Chaps are armed with 5 Awl-shaped Rays connected in a Cone; it has 5 Awl-shaped Stamina which are alternate with the Rays of the Chaps, terminated by erect acute Summits and 4 Germina supporting a slender Style the Length of the Petal, crowned by a single Stigma. The Germina turn to 4 gibbous acute pointed Seeds which ripen in the Empalement.

The Species are,

1. *SYMPHYTUM foliis ovato-lanceolatis decurrentibus Hort. Cliff. 47.* Comfrey with oval Spear-shaped running Leaves. *Symphytum Consolida major, flore purpureo quæ mas. C. B. P. 259.* Comfrey or greater Consoud with a purple Flower.

2. *SYMPHYTUM foliis summis oppositis. Lin. Sp. Pl. 136.* Comfrey with the upper Leaves placed opposite. *Symphytum majus tuberosâ radice C. B. P. 259.* Greater Comfrey with a tuberous Root.

3. *SYMPHYTUM foliis ovatis subpetiolatis. Lin. Sp. Pl. 136.* Comfrey with oval Leaves and short Foot Stalks. *Symphytum Orientale, folio subrotundo aspero, flore cæruleo. Tourn. Cor. 7.* Eastern Comfrey with a roundish Leaf, and a blue Flower.

There are several other Species of this Genus, but those here enumerated, are all the Sorts at present to be found in the *English* Gardens.

The 1st Sort grows naturally in *England*, but the most common here is that with a whitish yellow Flower, found growing by the Side of Ditches and other moist Places in great Plenty, but that with purple Flowers is the most common in *Holland* and *Germany*; these are supposed to be only accidental Varieties, which only differ in the Colour of their Flowers; however this Difference is permanent in the Plants raised from Seeds, as I have many Times found; nor are the two Kinds ever found mixed where they grow wild, for in those Places where the blue is found, the white is never seen; and vice versa; But as there are no specific Differences between them, I shall not separate them.

The common Comfrey has thick Roots composed of many fleshy Fibres or Fangs, which run deep in the Ground; they are black on the Outside, but white within, full of a slimy tenacious Juice. The lower Leaves are large, long, sharp-pointed, hairy and rough. The Stalks rise 2 Feet high, are garnished with oval Spear-shaped Leaves about 5 Inches long, and 2 broad near their Base, ending in acute Points; they are hairy, rough, and from their Base runs a leafy Border along the Stalk. From the upper Part of the Stalk are sent out some Side Branches, commonly garnished with 2 smaller Leaves, and terminated by loose Bunches of Flowers reflexed; each Flower has 1 tubulous Petal, whose upper Part is bellied and thicker than the lower, and the Chaps are closed by the Stamina and Rays, which cross it, and shuts up the Tube. These in the common *English* Sort are of a yellowish white, and the foreign one is of a purple Colour. It flowers in *June*, and the Seeds ripen in *August*.

The 2d Sort grows naturally in *Germany*; the Roots are composed of many thick fleshy Knobs or Tubers, joined, by fleshy Fibres; the Stalks incline on one Side; they rise a Foot and a Half high; the Leaves on the lower Part are 6 Inches long and 2 and a Half broad in the Middle, ending in acute Points, and not so rough and hairy as those of the other Species; they are placed alternate and sit close to the Stalks. The 2 upper Leaves on every Branch stand opposite, and just above them are loose Spikes or Bunches of pale yellow Flowers, whose Petals are stretched out farther beyond the Empalement than those of the other. This flowers at the same Time with the other.

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The 3d Sort grows naturally on the Side of Rivers near *Constantinople*; this has a perennial Root like the first; the Stalks grow 2 Feet high; the Leaves are rounder, and are armed with rough prickly Hairs. The Flowers are blue, and grow in Bunches like those of the first Sort; they appear in *March*, but are seldom succeeded by Seeds in *England*.

These Plants may be cultivated, either by sowing their Seeds in the Spring, or by parting their Roots: the latter Way being the more expeditious, is chiefly practised, where they are planted for Use. The best Season for parting the Roots is in Autumn; at which Time almost every Piece of a Root will grow. They should be planted about 2 Feet and a Half asunder, that they may have Room to spread, and will require no farther Care but to keep them clear from Weeds for they are extremely hardy, and will grow on almost any Soil, or in any Situation.

SYRINGA. *Lin. Gen. Pl. 22. Lilac. Tourn. Inst. R. H. 601. Tab. 372. Lilac.*

The Characters are,

The Flower has a small, tubulous, permanent Empalement of 1 Leaf, indented in 4 Parts at the Brim; it has 1 Petal with a long cylindrical Tube cut into 4 obtuse Segments at the Brim which spread open, and 2 very short Stamina terminated by small Summits, standing within the Tube; it has an oblong Germen supporting a short slender Style crowned by a thick bifid Stigma. The Germen turns to an oblong compressed acute-pointed Capsule with 2 Cells opening with 2 Valves contrary to the Partition, including in each Cell 1 oblong acute pointed Seed with a membranaceous Border.

The Species are,

1. *SYRINGA foliis ovato-cordatis*, *Hort. Cliff. 6. Syringa* with oval Heart-shaped Leaves. *Syringa cœrulea*. *C. B. P. 391. Blue Syringa*, and the *Lilac. Matth. 1237. The blue Lilac.*

2. *SYRINGA foliis lanceolatis*. *Lin. Sp. Pl. 9. Syringa* with Spear-shaped Leaves. *Lilac folio ligustri. Tourn. Inst. 602. Lilac* with a Privet Leaf, commonly called *Persian Jasmine*.

3. *SYRINGA foliis lanceolatis integris dissectisque laciniata*. *Hort. Cliff. 6. Syringa* with entire Spear-shaped Leaves and others which are cut and jagged. *Lilac laciniato folio. Tourn. Inst. 602. Lilac* with a cut Leaf commonly called *cut-leaved Persian Jasmine*.

The 1st Sort is very common in the *English Gardens*, where it has been long cultivated as a flowering Shrub. It is supposed to grow naturally in some Parts of *Persia*, but it is so hardy as to resist the greatest Cold of this Country. There are three Varieties of it, commonly cultivated in the *English Gardens*, which not only differ in the Colour of their Flowers, but in that of their Shoots and Leaves; one of these has white Flowers, one blue, and the third has purple Flowers; the latter is commonly known by the Title of *Scotch Lilac*, to distinguish it from the other. This is the most beautiful of the three and is probably called the *Scotch Lilac*, because it was first mentioned in the Catalogue of the *Edinburgh Garden*. Whether this was raised from Seeds, or which other Way it was obtained I could never learn; but I take it to be a distinct Species from the others, though there is not Marks enough upon them to distin-

guish their specifick Differences; because I have raised many of the Plants from Seeds, which have always retained their Difference, as have also the white, when they were propagated by Seeds, so that they may be rather esteemed as distinct Sorts, although by the Rules now admitted for determining specifick Differences, they may not have sufficient Marks whereby to distinguish them, and as they have been by most of the modern Botanists joined together, I shall not separate them again, but shall mention the Particulars in which they differ.

This Shrub grows to the Height of 18 or 20 Feet in good Ground, and divides into many Branches, those of the white Sort grow more erect than the other; and the purple or *Scotch Lilac*, has its Branches more diffused than either. The Branches of the white are covered with a smooth Bark of a gray Colour, those of the other two are darker. The Leaves of the white are of a very bright green, but those of the other are of a dark green; their Shape and Size are so near as not to be distinguished thereby. They are Heart-shaped, almost 5 Inches long, and 3 and a Half broad near their Base; their Foot Stalks are an Inch and a Half long, and placed opposite. The Buds of the future Shoots, which are very turgid before the Leaves fall, are of a very bright green in the white Sort, but those of the other two are of a dark green. The Flowers are always produced at the Ends of the Shoots of the former Year, and below the Flowers, come out Shoots to succeed them; for that Part upon which the Flowers stand, decays down to the Shoots below every Winter. There are generally 2 Bunches or Panicles of Flowers joined at the End of each Shoot, those of the blue are the smallest, and the Flowers, are smaller, their Brims expanded, and placed thinner than either of the other. The Bunches on the white are larger; the Flowers are closer placed, and larger than the blue; but those of the *Scotch* are larger, and the Flowers are fairer than those of either of the other, so make a much finer Appearance. The Panicles of Flowers grow erect, and being intermixed with the fine green Leaves, have a fine Effect, and if we add to this the Fragrancy of their Flowers, it may be ranged among the most beautiful Shrubs which now decorate the *English Gardens*. They flower in *May*, and when the Season is cool, these Shrubs will continue 3 Weeks in Beauty, but in hot Seasons the Flowers soon fade. Their Seeds are ripe in *September*, which if sown soon after, the Plants will come up the following Spring, but as their Roots send out great Plenty of Suckers annually, few Persons ever take the Trouble to propagate these Plants by Seeds. I have raised several Plants of the 3 Sorts from Seeds, and constantly found them prove the same as the Shrubs from which the Seeds were taken. These Plants do generally flower the 3d Year from Seed, and I have always found these Plants not so apt to send out Suckers, as those produced by Suckers, so are much more valuable, for the others put out such Plenty of Suckers, that if they are not annually taken from them, will starve them, so that this Way the Plants may be propagated in great Plenty.

These Plants thrive best on a light rich Soil, such as the Gardens near *London* are for the most Part composed of; and there they grow to a much larger Size, where they are permitted to stand unremoved, than in any other,

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other Part of *England*, for in strong Loam, or on chalky Land, they make no Progress. If the Suckers are small when taken from the old Plants, they should be planted in a Nursery, in Rows 3 Feet asunder, and one Foot Distance in the Rows, where they may stand a Year or two to get Strength, and then they should be removed to the Places where they are to remain. The best Time to transplant these Shrubs is in Autumn.

There is a Variety or two of these Shrubs with blotched Leaves, which some Persons are fond of; but as these Variegations are the Effect of Weakness, whenever the Shrubs become healthy, their Verdure returns again.

The 2d Sort grows naturally in *Persia*, but has been long cultivated in the *English* Gardens, where it is best known among the Gardeners by the Title of *Persian Jasmine*. This is a Shrub of much lower Growth than the former, seldom rising more than 5 or 6 Feet high. The Stalks of this Shrub are woody, covered with a smooth brown Bark; the Branches are slender, pliable, and extend wide on every Side; these frequently bend downward where they are not supported; they are garnished with narrow Spear-shaped Leaves placed opposite, about 2 Inches and a Half long, and three Fourths of an Inch broad, of a deep green Colour ending in acute Points. The Flowers are produced in large Panicles at the End of the former Year's Shoots, as the former; they are of a pale purple Colour, and have a very agreeable Odour. These appear the latter End of May, soon after those of the common Sort, and con-

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tinue longer in Beauty, but these do not perfect their Seeds in *England*.

There is a Variety of this with almost white Flowers, which has of late Years been obtained, but whether it came from Seeds, or was accidentally produced by Suckers from the purple Kind, I cannot say.

The 3d Sort differs from the second in having 2 Sorts of Leaves, those on the lower Part of the Branches are for the most Part entire; these are broader and shorter than those of the second, and do not end in so sharp Points. The Leaves on the younger Branches are cut into 3 or 5 Segments like winged Leaves almost to the Mid-rib. The Branches of this Sort are slenderer and weaker than those of the second, their Bark is of a darker brown, and the Flowers of a brighter purple Colour.

This was brought into *Europe* before the other, and came by the *Persian* Title *Agem*. Both these Sorts are usually propagated by Suckers, which their Roots send out in great Plenty, these should be carefully taken off from the old Plants in Autumn, and planted in a Nursery as before directed for the first, where they may grow 2 Years to get Strength, and may then be transplanted to the Places where they are to remain. The Plants which are so propagated, are always very prolific in Suckers, for which Reason it will be a better Way to raise them by laying down their young Branches, which in one Year will be sufficiently rooted to transplant, and may then be treated as the Suckers.

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TABERNÆMONTANA. *Plum. Gen. Nov. 18. Tab. 30. Lin. Gen. Pl. 265.*

The Characters are,

The Flower has a small Empalement cut into 5 acute Parts; it has 1 Funnel-shaped Petal, with a long cylindrical Tube, bellied at both Ends, and the Brim is cut into 5 oblique Segments; it has 5 small Stamina in the Middle of the Tube, terminated by Summits which join together, and 2 Germina supporting an Awl-shaped Style, crowned by decayed Stigmas. The Germina turn to 2 bellied Capsules horizontally reflexed, opening with 1 Valve, having 1 Cell filled with oblong oval Seeds lying imbricatum and surrounded with Pulp.

The Species are,

1. TABERNÆMONTANA *foliis lanceolatis oppositis, floribus corymbosis lateralibus*. *Tabernæmontana* with Spear-shaped Leaves placed opposite, and Flowers growing in a Corymbus on the Sides of the Branches. *Tabernæmontana laetescens, citrii foliis undulatis*. *Plum. Nov. Gen. 18.* Milky *Tabernæmontana* with waved Citron Leaves.

2. TABERNÆMONTANA *foliis oblongo-ovatis acuminatis oppositis, floribus corymbosis terminalibus*. *Tabernæmontana* with oblong, oval, acute-pointed Leaves placed opposite and Flowers growing in a Corymbus, terminating the Branches. *Tabernæmontana laetescens, lauri folio, flore albo, siliquis rotundioribus*. *Eoist. Mss.* Milky

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Tabernæmontana with a Bay Leaf, a white Flower, and rounder Pods.

Father *Plumier*, who constituted this Genus, gave it this Title, in Honour of Dr. *James Theodore*, who was called *Tabernæmontanus*, from a little Village in *Germany*, where he was born. He was one of the most knowing Botanists of his Age, and published at *Frankfort* a Folio, in a long Form in the Year 1590, in which are the Figures of 2250 Plants.

The 1st Sort grows naturally in *Jamaica*, and some of the other Islands in the *West-Indies*. Sir *Hans Sloane* has figured it in his *History of Jamaica*, under the Title of *Nerium Arboreum folio latiore obtuso, flore luteo minore*. *Tab. 186. f. 2.* Tree-like *Nerium* with a broader obtuse Leaf, and a smaller Flower which is of a yellow Colour.

This rises with an upright woody Stalk 15 or 16 Feet High, covered with a smooth gray Bark, which abounds with a milky Juice, and sends out several Branches from the Side which grow erect, and have many Joints; these are garnished with thick Leaves which have a milky Juice; they are from 5 to 6 Inches long, and 2 broad in the Middle, drawing to a Point at each End: they are of a lucid green, and have many transverse Veins, from the Mid-rib to the Border, standing opposite on Foot Stalks an Inch long. The Flowers come out in roundish Bunches from the Wings of the Stalk; they are

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are small, of a bright yellow Colour, and have an agreeable Odour. The Tube of the Flower is half an Inch long, the Brim is cut into 5 acute Points, which spread open like those of the common Jasmine. These Flowers in their native Soil, are succeeded by 2 swelling Capsules joined at their Base, but spread from each other horizontally, and filled with oblong Seeds, lying over each other like the Scales of Fish, and included in a soft Pulp.

The 2d Sort was discovered by the late Dr. William Houfoun in the Year 1730, growing naturally at La Vera Cruz. This rises with a woody Stalk 10 or 12 Feet high, covered with a wrinkled gray Bark, sending out many Branches toward the Top, garnished with oblong oval Leaves of a lucid green, and of a thick Consistence; they are 5 Inches long, and two and a Half broad, rounded at both Ends, but terminate with an acute Point. These are placed opposite, and have short Foot Stalks. The Flowers come out in pretty large roundish Bunches at the End of the Branches; they are smaller than those of the first sort, and are white, having an agreeable Scent. These are succeeded by shorter and rounder Pods, which spread from each other horizontally like the former.

Both these Plants are very impatient of Cold, so will not live in this Country, unless placed in a warm Stove; they may be propagated by Seeds, which must be procured from the Countries where the Plants grow naturally, for they do not produce any Seeds in Europe; these should be sown early in the Spring, on a hot Bed; and when the Plants are come up, they must be carefully transplanted into small Pots filled with light rich Earth, and then plunged into a hot Bed of Tanners Bark; being careful to shade them in the Heat of the Day, untill they have taken new Root; after which Time they must have free Air admitted to them every Day when the Weather is warm; but if the Nights should prove cold, the Glasses of the hot Bed should be covered with Mats every Evening, soon after the Sun goes off from the Bed. These Plants must be often refreshed with Water; but it must not be given to them in large Quantities, especially while they are young, for as they are full of a milky Juice, they are very subject to rot with much Moisture.

The Plants may remain during the Summer Season, in the hot Bed, provided the Tan is stirred up to renew the Heat when it wants, and a little new Tan added; but at Michaelmas, when the Nights begin to be cold, the Plants should be removed, and plunged into the Bark Bed in the Stove; where during the Winter Season, they must be kept in a moderate Degree of Warmth, and in cold Weather they should have but little Water given them, lest it should rot them. As these Plants are too tender to live in the open Air in this County, they should constantly remain in the Stove, where, in warm Weather, they may have free Air admitted to them, by opening the Glasses of the Stove: but in cold Weather they must be kept warm. With this Management the Plants will thrive and produce their Flowers, and as their Leaves are always green, they will make a pleasant Diversity among other tender exotick Plants in the Stove.

These Plants may also be propagated by Cuttings du-

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ring the Summer Season, which should be cut off from the old Plants, and laid to dry in the Stove 5 or 6 Days before they are planted, that the wounded Parts may heal, otherwise they will rot. These Cuttings should be planted in Pots filled with fresh light Earth, and plunged into the hot Bed of Tanner's Bark, and closely covered with a Hand Glass, observing to shade them from the Sun in the Middle of the Day in hot Weather, and to refresh them now and then with a little Water. When the Cuttings have taken Root, they may be transplanted into separate Pots, and treated as those raised from Seeds.

TACAMAHACA. See Populus.

TAGETES. Tourn. Inst. R. H. 478. Tab. 278. Lin. Gen. Pl. 865. African or French Marigold in French, Oillet d' Inde.

The Characters are,

The common Empalement of the Flower is single, of 1 Leaf, oblong, erect, and five-cornered; the Flower is compound and radiated, the Rays or Border is composed of 5 female half Florets which are Tongue-shaped. The Disk or Middle is made up of hermaphrodite Florets which are tubulous, and cut into 5 obtuse Segments; these have 5 short hair-like Stamina terminated by cylindrical Summits, and an oblong Germen supporting a short slender Style, crowned by a thin, bifid, reflexed Stigma. The Germen becomes a single, linear, compressed Seed, almost the Length of the Empalement, crowned by 5 acute-pointed unequal Scales. The Female half Florets have an oblong Germen, with a Style and Stigma like the hermaphrodite, and are succeeded by Seeds of the same Form, but have no Stamina.

The Species are,

1. TAGETES caule simplici erecto, pedunculis nudis unifloris. Hort. Cliff. 418. Tagetes with a single erect Stalk, and naked Foot Stalks bearing single Flowers. Tagetes maximus rectus, flore simplici ex-luteo pallido. L. B. 3. p. 100. Greatest upright African Marigold with a pale single yellow Flower.

2. TAGETES caule subdiviso diffuso. Hort. Cliff. 418. Tagetes with a diffused subdivided Stalk. Tagetes Indicus minor, multiplicato flore. Tourn. Inst. 488. Smaller Indian Tagetes with double Flowers, commonly called French Marigold.

3. TAGETES caule simplici recto, pedunculis squamosis multifloris. Hort. Cliff. 419. Tagetes with a single erect Stalk, and scaly Foot Stalks bearing many Flowers. Tagetes multiflora minuto flore albicante. Hort. Elib. 374. Many flowering Tagetes with a small white Flower.

4. TAGETES caule simplici erecto, foliis cordatis simplicibus, pedunculis nudis unifloris. Tagetes with a single Stalk, simple Heart-shaped Leaves, and naked Foot Stalks having one Flower. Tagetes Americana, folio singulari subrotundo. Houst. Mss. American Tagetes with a single roundish Leaf.

The 1st Sort grows naturally in Mexico, but has been long cultivated in the English Gardens, where it is commonly titled African, or African Marigold; of this there are the following Varieties:

1. Pale yellow, or Brimstone Colour, with single, double, and fistulous Flowers.

2. Deep yellow, with single, double, and fistulous Flowers.

3. Orange-

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3. Orange-coloured, with single, double, and fistulous Flowers.

4. Middling *African*, with Orange coloured Flowers

5. Sweet-scented *African*.

These are all very subject to vary, so that unless the Seeds are very carefully saved from the finest Flowers, they are very apt to degenerate, nor should their Seeds be too long sown in the same Garden without changing it, for the same Reason; therefore, those who are desirous to have these Flowers in Perfection, should exchange their Seeds with some Person of Integrity at a Distance where the Soil is of a different Nature, at least every other Year. If this is done, the Varieties may be continued in Perfection.

This Plant is so well known as to need no Description. It flowers from the Beginning of *July*, till the Frost puts a Stop to it. The second Sort grows naturally in *Mexico*, but has been long in the *English* Gardens, where it is distinguished from the first by the Title of *French* Marigold.

Of this there are several Varieties, some of which have much larger Flowers than others, and their Colour varies greatly, there are some beautifully variegated, and others quite plain, but as these are Accidents arising from Culture, they do not merit farther Distinction, for I have always found that Seeds saved from the most beautiful Flowers will degenerate, especially if sown in the same Garden for 2 or 3 Years together, without changing the Seed.

These Plants are annual, so must be propagated from Seeds every Spring, which may be sown on a moderate hot Bed the Beginning of *April*, and when the Plants are come up, they should have Plenty of fresh Air, for if they are drawn too much, they will not afterward become handsome, notwithstanding they have all possible Care taken of them. When they are about 3 Inches high, they should be transplanted on a very moderate hot Bed, which may be arched over with Hoops, and covered with Mats, for these Plants are hardy enough to be brought up without Glasses; in this Bed they should be planted about 6 Inches asunder each Way, observing to water and shade them until they have taken Root; but as they Plants acquire Strength, they should be inured to bear the open Air by Degrees, and about the Beginning of *May* they should be taken up, with a Ball of Earth to the Root of each Plant, and planted into the Borders of the *Parterre* Garden, or into Pots, for furnishing the Courts, &c. shading them carefully from the Sun till they have taken new Root, and also supplying them duly with Water. When their Flowers appear, if any should prove single, the Plants should be destroyed, and then those Pots may be removed to the Court where the several Varieties, being intermixed with other annual Plants afford an agreeable Variety.

These Plants have a strong disagreeable Scent, especially when handled; for which Reason they are not so greatly esteemed for planting near Habitations, but the Flowers of the sweet-scented Sort, being more agreeable, are generally preferred, especially for planting in small Gardens.

The 3d Sort grows naturally in *Chili* in the *Spanish* *West-Indies*. This is a Plant of taller Growth than ei-

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ther of the former. The Stalk is single, erect, and branches a little toward the Top; it rises about 10 Feet high; the Branches grow erect. The Leaves are narrower than either of the other. The Foot Stalks of the Flowers, are scaly and stand erect, close to the Stalk; these sustain 3 or 4 small white Flowers, which appear very late in Autumn, so that unless it is kept in a Glass Case the Seeds will not ripen here. This Plant has very little Beauty, so is only preserved for Variety.

The 4th Sort rises with an upright Stalk about 2 Feet high, sending out a few Branches toward the Top, garnished with Heart-shaped Leaves standing on long slender Foot Stalks; those on the lower Part of the Stalk are 2 Inches and a Half long, and one and a Half broad toward their Base, ending in very acute Points, being in Shape like those of the black Poplar, rough to the Touch, and slightly crenated on their Edges; the Branches and Stalks are each terminated by 1 large yellow Flower standing on a long naked Foot Stalk. The Empalement of the Flower is short, the Leaves of which it is composed are oblong and oval drawing to a Point. The female Florets, which compose the Rays or Border, are much longer than the Empalement. The hermaphrodite Florets, in the Disk or Middle are equal; they are of a deep yellow Colour, and make a good Appearance, for the Flowers are double. This Plant was discovered by the late Dr. *Houssain* growing naturally at *La Vera Cruz* in *New Spain*, from whence he sent the Seeds to *England*.

The two last Sorts are not so hardy as the former, so the Seeds of these should be sown earlier in the Spring on a good hot Bed, and when the Plants are fit to remove, they should be transplanted on a fresh hot Bed, at about 3 Inches Distance each Way, observing to shade them from the Sun till they have taken new Root, then they should be treated as the *Amaranthus*, and other tender annual Plants, being careful not to draw them up weak; when they have spread so as to meet each other, they should be taken up with Balls of Earth to their Roots, and planted in Pots with light rich Earth, and plunged into a hot Bed under a deep Frame, where the Plants may have Room to grow, being careful to shade them from the Sun till they have taken new Root, after which they must have Air and Water in Proportion to the Warmth of the Season, and when the Plants have grown too tall to remain longer in the Frame, they should be removed to an airy Glass Case, where they may stand to flower and ripen their Seeds.

TAMARINDUS. *Tourn. Inst. R. H.* 660. *Tab.* 445. *Lin. Gen. Pl.* 46. The Tamarind Tree.

The Characters are,

The Empalement of the Flower is composed of 4 oval plain Leaves which are equal; the Flower has 5 Petals, almost like those of the *Butterfly* Kind, 1 of them standing erect, 2 are placed like Wings on each Side, and 2 reflect downward; it has 3 Awl-shaped Stamina situated in the Sinuses of the Empalement, and arched toward the upper Petal, terminated by single Summits, and an oblong oval Germen supporting an Awl-shaped ascending Style, crowned by a single Stigma. The Germen becomes a long swelling compressed Pod having a double Cover, and 1 Cell containing 3, 4, or 5 angular compressed Seeds surrounded with Pulp.

We know but one Species of this Genus, viz.

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TAMARINDUS Hort. Cliff. 18. The Tamarind Tree. This is the *Siliqua Arabica*, quæ *Tamarindus*. C. B. P. 403. The *Arabian* Pod or Tamarind.

This Tree grows naturally in both *Indies* and also in *Egypt*, but it has been supposed by some eminent Botanists, that the Tamarind which grew in the *East-Indies*, was different from that of the *West-Indies*, because the Pods of the first, are almost double the Length of those of the latter. The Pods which have been brought me from the *East-Indies*, have generally been so long as to contain 5, 6, and sometimes 7, Seeds, whereas those of the *West-Indies* have very rarely more than 4; but the Plants which I have raised from the Seeds of both Sorts, are so like as not to be distinguished, therefore I suppose it may be owing to the Soil, or Culture, that one is so much larger than the other.

This grows to a very large Size in those Countries where it is a Native, but in *England* it will not thrive out of a Stove, especially in Winter. The Stem is very large, covered with a brown Bark, and divides into many Branches at the Top, which spread wide every Way, and are closely garnished with winged Leaves, composed of 16 or 18 Pair of Lobes, without a single one at the End. The Lobes are about half an Inch long, and a sixth Part of an Inch broad, of a bright green, a little hairy, and sit close to the Mid-rib. The Flowers come out from the side of the Branches, five, six, or more together on the same Foot Stalk in loose Bunches; these are composed of 5 reddish Petals, one of which is reflexed upward like the Standard in some of the Butterfly Flowers, two others stand on each Side like the Wings, and the other two are turned downwards; these, (in the Countries where the Plants grow naturally) are succeeded by thick compressed Pods, 2, 3, 4, or 5 Inches long, having a double Skin or Cover, and swell in every Place where the Seeds are lodged, full of an acid stringy Pulp, which surrounds smooth, compressed, angular Seeds.

The Tamarinds brought from the *East-Indies*, are darker and drier, but contain more Pulp, being preserved without Sugar, and are fitter to be put into Medicines than those from the *West-Indies*, which are redder, have less Pulp, and are preserved with Sugar, so are pleasanter to the Palate.

The Plants are preserved in the Gardens of those who have Conveniency to maintain rare exotick Trees and Shrubs.

They are easily propagated by sowing their Seeds on a hot Bed in the Spring; and when the Plants are come up, they should be planted each into a separate small Pot filled with light rich Earth, and plunged into a hot Bed of Tanners Bark, to bring them forward, observing to water and shade them until they have taken Root; and as the Earth in the Pots appears dry, they must be watered from Time to Time, and should have Air given to them in Proportion to the Warmth of the Season, and the Bed in which they are placed; when the Pots in which they are planted are filled with their Roots, the Plants should be shifted into Pots of a larger Size, which must be filled up with light Earth, and again plunged into the hot Bed, giving them Air, as before, according to the Warmth of the Season, but in very hot Weather the Glasses should be shaded with Mats in the

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Heat of the Day, otherwise the Sun will be too violent for them through the Glasses; nor will the Plants thrive, if they are exposed to the open Air, even in the warmest Season; so that they must be constantly kept in the Bark Stove both Summer and Winter, treating them as hath been directed for the Coffee Tree, with whose Culture they will thrive exceeding well.

These Plants, if rightly managed, will grow very fast; for I have had them upward of 3 Feet high in one Summer from Seed, and have had 2 Plants which produced Flowers the same Season they were sown; but this was accidental, for none of the older Plants have produced any Flowers, although I have several Plants of different Ages; some of which are 16 or 18 Years old, and about 12 Feet high, with large spreading Heads.

TAMARIX. Lin. Gen. Pl. 337. *Tamariscus*. Tourn. Inst. R. H. 661. The Tamarisk.

The Characters are,

The Empalement of the Flower is obtuse, erect, and permanent, it is cut into 5 Parts; the Flower has 5 oval concave Petals, which spread open, and 5 Hair-like Stamina terminated by roundish Summits; it has an acute-pointed Germen without a Style crowned by 3 oblong feathery twisted Stigmas. The Germen turns to an oblong acute-pointed Capsule with 3 Corners, having 1 Cell, opening with 3 Valves, containing many small downy Seeds.

The Species are,

1. **TAMARIX floribus pentandris**. Hort. Cliff. 111. Tamarisk with Flowers having five Stamina. *Tamariscus Narbonensis*. Lob. Icon. 218. French Tamarisk.

2. **TAMARIX floribus decandris**. Hort. Cliff. 111. Tamarisk whose Flowers have 10 Stamina. *Tamariscus Germanica*. Lob. Icon. 218. German Tamarisk.

The 1st Sort grows naturally in the South of *France*, in *Spain*, and *Italy*, where it grows to a Tree of middling Size, but in *England*, is seldom more than 14 or 16 Feet high. The Bark is rough, and of a dark brown Colour; it sends out many slender Branches, most of which spread out flat and hang downward at their Ends; these are covered with a Chestnut-coloured Bark, and garnished with very narrow finely divided Leaves, which are smooth, of a bright green Colour, and have small Leaves or Indentures which lie over each other like Scales of Fish. The Flowers are produced in taper Spikes at the End of the Branches, several of them growing on the same Branch. The Spikes are about an Inch long, and as thick as a large Earth Worm. The Flowers are set very close all round the Spike; they are very small and have 5 concave Petals of a pale Flesh Colour, with 5 slender Stamina terminated by roundish red Summits. The Flowers appear in July, and are succeeded by oblong, acute-pointed, three-cornered Capsules, filled with small downy Seeds, which seldom ripen in *England*.

The Wood, Bark, and Leaves of this Tree are used in Medicine, and are accounted specifick for all Disorders of the Spleen, as being believed to lessen it much. The Bark is sometimes used for Rickets in Children.

The 2d Sort grows naturally in *Germany*, in moist Land; this is rather a Shrub than Tree, having several ligneous Stalks arising from the same Root, which grow erect,

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erect, sending out many Side Branches which are also erect; they have a pale green Bark when young, which afterward changes to a yellowish Colour. The Leaves are shorter, and set closer together than those of the other Sort, and are of a lighter green, approaching to a gray Colour; the Flowers are produced in long loose Spikes at the End of the Branches, standing erect; they are larger than those of the former, and have 10 Stamina standing alternately. It flowers about the same Time as the former.

These both cast their Leaves in Autumn, and it is pretty late in the Spring before the young ones push out, which renders them less valuable; they are now frequently planted in Gardens for Ornament, and, when they are mixed with other Shrubs, make a pretty Variety.

They may be easily propagated by laying down their tender Shoots in Autumn, or by planting Cuttings in an East Border, which, if supplied with Water the Spring before they begin to shoot in dry Weather, will take Root in a short Time, but they should not be removed until the following Autumn, at which Time they may be either placed in a Nursery to be trained up 2 or 3 Years, or else into the Quarters where they are to remain, observing to mulch their Roots, and water them according as the Season may require, until they have taken Root; after which, the only Culture they will require is to prune off the straggling Shoots, and keep the Ground clean about them.

TAMUS. Lin. Gen. Pl. 991. Tamnus. Tourn. Inst. R. H. 102. Tab. 28. The Black Briony.

The Characters are,

It has male and female Flowers on different Plants. The male Plants have Empalements, composed of 6 oval Spear-shaped Leaves, which spread wide at the Top; they have no Petals, but 6 short Stamina terminated by erect Summits; the female Flowers have Bell-shaped Empalements of 1 Leaf cut into 6 Spear-shaped Segments, which sit upon the Germen; these have no Petals, but have oblong punctured Nectaria sitting on the Inside of each Segment of the Empalement, and a large, oblong, oval, smooth German under the Empalement, with a cylindrical Style, crowned by three reflexed indented Stigmas. The Germen becomes an oval Berry with 3 Cells, including 2 globular Seeds.

The Species are,

1. TAMUS foliis cordatis indivisis. Hort. Cliff. 458. Tamus with Heart-shaped undivided Leaves. Bryonia laevis sive nigra racemosa. C. B. P. 297. Common black Briony.

2. TAMUS foliis trilobis. Lin. Sp. Pl. 1028. Tamus with Leaves divided into 3 Lobes. Tamus Cretica, trifido folio. Tourn. Cor. 3. Black Briony of Crete with a trifid Leaf.

The 1st Sort is rarely cultivated in Gardens, but grows wild under the Sides of Hedges in divers Parts of England, and is there gathered for medicinal Use. The Root is very large, fleshy, and has a dark brown Skin or Cover; the Stalks are smooth, and twine round any neighbouring Support, whereby they rise to the Height of 10 or 12 Feet; they are garnished with smooth Heart-shaped Leaves of a lucid green, produced alternately. The Flowers are produced in long

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Bunches from the Side of the Stalks; those of the male Plants fall off soon after the Farina is cast abroad, but the female Flowers are succeeded by oval smooth Berries which are red when ripe. It flowers in July, and the Fruit ripens in Autumn.

It may be easily propagated by sowing the Seeds, soon after they are ripe, under the Shelter of Bushes, where, in the Spring, the Plants will come up and spread their Branches over the Bushes, and support themselves, requiring no farther Care, and their Roots will abide many Years in the Ground without decaying.

The 2d Sort was discovered in the Island of Crete by Dr. Tournfort, who sent the Seeds to the Royal Garden at Paris; this has a rounder Root than the other. The Stalks twine round any neighbouring Support in like Manner; the Leaves of this are divided into 3 Lobes, in which the principal Difference consists. This is an abiding Plant, which is hardy enough to live in the full Ground in England, and may be propagated as the other.

TANACETUM. Tourn. Inst. R. H. 461. Tab. 261. Lin. Gen. Pl. 848. Tansey; in French, Tanesie.

The Characters are,

It has a Flower composed of hermaphrodite and female Florets contained in 1 common hemispherical imbricated Empalement, whose Scales are compact and acute-pointed. The hermaphrodite Florets, which compose the Disk of the Flower, are Funnel-shaped, and cut at the Top into 5 Segments reflexed; these have 5 short Hair-like Stamina terminated by cylindrical tubulous Summits, and a small oblong Germen, supporting a slender Style, crowned by a bifid revolved Stigma. The Germen becomes an oblong naked Seed. The female Florets are trifid, which compose the Rays or Border, and are deeply divided within; these have an oblong Germen, with a slender Style, crowned with 2 reflexed Stigmas but no Stamina.

The Species are,

1. TANACETUM foliis bipinnatis incisiss serratis. Hort. Cliff. 398. Tansey with doubly-winged cut Leaves which are sawed. Tanacetum vulgare luteum. C. B. P. 132. Common yellow Tansey.

2. TANACETUM foliis pinnatis, laciniis linearifliformibus, corymbis glabris, caule herbaceo. Lin. Sp. Pl. 844. Tansey with winged Leaves which are cut into linear Thread-like Segments, a smooth Corymbus, and an herbaceous Stalk. Tanacetum foliis pinnatis multifidis, laciniis linearibus trifidis, Flor. Suec. 2. p. 134. Tansey with many-pointed winged Leaves, having trifid linear Segments.

3. TANACETUM foliis ovatis integris serratis. Hort. Cliff. 398. Tansey with oval, entire, sawed Leaves. Balsamita major. Dod. Pempt. 296. Costmary or Alecoast.

4. TANACETUM foliis pinnatifidis, laciniis lanceolatis obtusiusculis integerrimis. Lin. Sp. Pl. 844. Tansey with Wing pointed Leaves having Spear-shaped entire, obtuse Segments. Tanacetum Africanum arboreseens, foliis lavenderae multifido folio. H. Amst. 2. 210. African Tree Tansey with a Leaf like cut-leaved Lavender.

5. TANACETUM foliis pinnato-multifidis, laciniis linearibus subdivisis. Hort. Cliff. 398. Tansey with many-pointed winged Leaves, having linear Segments divided and acute. Tanacetum Africanum, frutescens, foliis lavenderae multifidis, longe minoribus, graveolens. Boerb. Ind. Pl.

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1. p. 124. Shrubby *African* Tansey with Leaves like the cut-leaved Lavender, but much smaller and stronger scented.

6. *TANACETUM foliis pinnatifidis, laciniis linearilanceolatis integerrimis.* Tansey with Wing-pointed Leaves, whose Segments are linear, Spear-shaped, and entire. *Tanacetum Africanum fruticosum, multiflorum, foliis tanaceti vulgaris decupla minoribus.* Hort. Amst. 2. p. 199. Shrubby *African* many-flowering Tansey with Leaves like the common Tansey, but ten Times less.

7. *TANACETUM foliis pinnatis, pinnis linearibus remotis integerrimis.* Lin. Sp. Pl. 843. Tansey with winged Leaves, whose Lobes are linear, grow at a Distance from each other, and are entire. *Elicbrysum Africanum frutescens, foliis crithmi marini.* Hort. Amst. 2. p. 113. Shrubby *African* Goldy-locks with Leaves like Samphire.

The 1st Sort is the common Tansey used in Medicine and the Kitchen; this grows naturally by the Sides of Roads, and the Borders of Fields in many Parts of *England*. It has a fibrous creeping Root which will spread to a great Distance, where not confined, from which arise many channeled Stalks, from 2 to almost 4 Feet high, according to the Goodness of the Soil; these are garnished with doubly-winged Leaves, whose Lobes are cut and sharply sawed; they are of a deep green Colour, and have a pleasant grateful Odour. The Stalks divide near the Top into 3 or 4 Branches which stand erect, and are terminated by Umbels of naked yellow Flowers, composed of many Florets, included in hemispherical scaly Empalements. These appear in *July*, and are succeeded by Seeds which ripen in *September*.

There are three Varieties of this, one with a curled Leaf, titled Double Tansey by Gardeners; another with variegated Leaves, and a third with larger Leaves which have little Scent; but, as these have accidentally been produced from Seeds of the common Tansey, they are not enumerated as distinct Species.

This Sort is easily propagated by the creeping Roots, which, if permitted to remain undisturbed, will in a short Time overspread the Ground, so that where-ever this is planted in a Garden, the Slips should be placed at least a Foot asunder, and in particular Beds, where the Paths round them may be often dug, to keep their Roots within Bounds. They may be transplanted either in Spring or Autumn, and will thrive in almost any Soil or Situation.

The common Tansey is greatly used in the Kitchen early in the Spring, at which Season, that which is in the open Ground, or especially in a cold Situation, is hardly forward enough to cut, so that where this is much wanted at that Season, it is the best Way to make a gentle hot Bed in *December*, and plant the old Roots thereon without parting them, and arch the Bed over with Hoops, to cover it with Mats in cold Weather, by which Method the Tansey will come up in *January*, and be fit to cut in a short Time after.

The 2d Sort grows naturally in *Siberia*; this has a perennial fibrous Root. The Stalks rise near 2 Feet high; the Leaves are narrow and winged; the Lobes are very narrow, and end in 2 or 3 Points which are entire; the Flowers are produced in small thin Umbels from

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the Side, and at the Top of the Stalk; they are yellow and but small, the Umbels having few Flowers in each. This flowers in *June* and *July*, and the Seeds ripen in Autumn: It may be propagated as the first.

The 3d Sort grows naturally in the South of *France* and *Italy*, but is here planted in Gardens, and was formerly pretty much used in the Kitchen and also in Medicine. The Roots of this are hard, fleshy, and creep in the Ground; the lower Leaves are oval and entire; they are near 3 Inches long, and 1 and a Half broad, sawed on their Edges, of a grayish Colour, and have long Foot Stalks. The Stalks rise from 2 to 3 Feet high, and send out Branches from the Side; they are garnished with oval sawed Leaves like those at the Bottom, but smaller, and sit close to the Stalk. The Flowers are produced at the Top of the Stalks in a loose Corymbus; they are naked, and of a deep yellow Colour; these appear in *August*, but are not succeeded by Seeds in *England*. The whole Plant has a soft pleasant Odour.

It is propagated easily by parting their Roots: The best Time for this is Autumn, that they may be well established in the Ground before the Spring. Where this Plant is cultivated for Use, the Plants should be planted in Beds, at 2 Feet Distance every Way, that they may have Room to grow, for in 2 Years the Roots will meet, so every other Year they should be transplanted and parted to keep them within Compass; they will thrive in almost any Soil or Situation, but will continue longest in dry Land.

The 4th Sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby Stalk, 8 or 10 Feet high, sending out Branches on every Side the whole Length, garnished with Wing-pointed Leaves, whose Segments are Spear-shaped, entire, and blunt-pointed. The Flowers are produced in small roundish Bunches at the End of the Branches; they are of a Sulphur Colour, and appear in *May*, but there is a Succession of Flowers on the same Plant great Part of Summer. The Seeds rarely ripen in *England*.

The 5th Sort was brought from the *Cape of Good Hope*, where it grows naturally; this rises with a branching shrubby Stalk, 3 or 4 Feet high, garnished with Wing-pointed Leaves, whose Lobes are very narrow, and frequently cut into acute Segments. The Flowers are produced in small roundish Bunches at the End of the Branches; they are larger than those of the former Sort, and are of a bright yellow Colour. It flowers about the same Time with the former.

The 6th Sort is a Native of the *Cape of Good Hope*, from whence it was brought into the *Dutch* Gardens; this has a very branching shrubby Stalk, which rises 4 or 5 Feet high, closely garnished with Wing-pointed Leaves of a deep green, whose Segments are linear, Spear-shaped, and entire. The Flowers are produced in small loose Bunches at the End of the Branches; they are much less than those of either of the former Sorts, and are of a Sulphur Colour, appearing about the same Time as the former.

The 7th Sort grows naturally at the *Cape of Good Hope*; this has a thick shrubby Stalk, covered with a gray Bark, which rises 7 or 8 Feet high, sending out many Branches on every Side, closely garnished with

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with linear-winged Leaves, whose Lobes or Pinnæ are very narrow, and spread from each other. The Leaves sit close to the Stalks on every Side; the Branches are terminated by close large roundish Bunches of bright yellow Flowers. Some of the Foot Stalks sustain but 1 others 2, 3, or 4 Flowers upon each, which begin to appear the Beginning of *July*, and there is a Succession of them on the same Plants till late in Autumn, and those, which come early in the Season, will be succeeded by Seeds which ripen in Winter.

These 4 last-mentioned Sorts are too tender to live through the Winter in the open Air, so must be kept in Pots, and removed into Shelter before hard Frosts come on in Winter; they are all of them easily propagated by Cuttings, which may be planted in a Bed of loamy Earth, during any of the Summer Months; these should be shaded from the Sun until they have taken Root, and must be frequently refreshed with Water. When they have good Roots, they should be taken up with Balls of Earth about their Roots, and planted in Pots, placing them in a shady Situation till they have taken new Root; then they may be removed to a sheltered Situation, placing them among other hardy exotic Plants, where they may remain till late in *October*, when they must be put into Shelter. These Plants are so hardy, as only to require Protection from hard Frost, so must not be tenderly treated, and in mild Weather should always be as much exposed to the Air as possible, to prevent their drawing weak.

TAN, or **TANNERS Bark**, is the Bark of the Oak Tree, chopped or ground into coarse Powder, to be used in tanning or dressing Skins; after which it is of great Use in Gardening: First, by its Fermentation (when laid in a proper Quantity), the Heat of which is always moderate, and of a long Duration, which renders it of great Service for hot Beds; and secondly, after it is well rotted, it becomes excellent Manure for all Sorts of cold stiff Land, upon which one Load of Tan is better than two of rotten Dung, and will continue longer in the Ground.

The Use of Tan for hot Beds has not been many Years known in *England*. The first hot Beds of this Sort, which were made in *England*, were at *Blackbeath* in *Kent* above 60 Years ago; these were designed for raising Orange Trees, but the Use of these hot Beds being but little known at that Time, they were made but by two or three Persons, who had learned the Use of them in *Holland* and *Flanders*, where the Gardeners seldom make any other hot Beds; but in *England* there were very few hot Beds made of Tanners Bark, before the Ananas Plants were introduced into this Country, which was in 1719, since which Time the Use of these hot Beds has been more general, and are now made in all those Gardens, where the Ananas Plants are cultivated, or where there are Collections of tender exotic Plants preserved, and the Gardeners here are now better skilled in making and managing these hot Beds, than in most other Countries, which might render it less necessary to give a full Description of them here; but as there may be some Persons in the remote Parts of *England*, who have not had an Opportunity of informing themselves of the Use of Tanners Bark for this Purpose, I shall insert the shortest and plainest Method of

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making and managing these hot Beds, as they are practised by the most knowing Persons, who have long made Use of them, and first I shall begin with the Choice of the Tan.

The Tanners in some Parts of *England* do not grind the Bark to reduce it into small Pieces, as is commonly practised by the Tanners near *London*, where there is great Difference in the Size of the Bark, some being ground much smaller than the other, according to the different Purposes for which it is intended; but in many Places the Bark is only chopped into large Pieces, which renders it very different for the Use of hot Beds, for if the Tan is very coarse, it will require a longer Time to ferment, than the small Tan, but when it begins to heat, it will acquire a much greater Degree, and will retain the Heat a much longer Time than the small, therefore where there is Choice, the middling-sized Tan should be preferred, for it is very difficult to manage a hot Bed when made of the largest Tan; the Heat of which is often so great, as to scald the Roots of Plants, if the Pots are fully plunged into the Bed, and I have known this violent Heat continue upward of two Months, so that it has been unsafe to plunge the Pots more than half their Depth into the Tan, till near three Months after the Beds have been made; therefore where the Persons, who have the Care of these Beds, do not diligently observe their working, they may in a short Time destroy the Plants placed in them: On the other hand, if the Tan is very small, it will not retain the Heat above a Month or six Weeks, and will be rotten and unfit for a hot Bed in a short Time, so that where the middle-sized Tan can be procured, it should always be preferred to any other.

The Tan should be always such as has been newly taken out of the Pits, for if it lies long in the Tanners Yard, before it is used, the Beds seldom acquire a proper Degree of Heat, nor do they continue their Heat long; so that when it has been more than a Fortnight or three Weeks out of the Pit, it is not so good for Use as that which is new. If the Tan is very wet, it will be proper to spread it abroad for two or three Days, to drain out the Moisture, especially if it is in Autumn or Winter Season, because then, as there will be little Sun to draw a Warmth into the Tan, the Moisture will prevent the Fermentation, and the Beds will remain cold, but in the Summer Season there is no great Danger from the Moisture of the Tan. The Heat of the Sun through the Glasses will be then so great, as soon to cause a Fermentation in the Tan.

These Tan Beds should always be made in Pits, having Brick Walls round them, and a Brick Pavement at the Bottom, to prevent the Earth from mixing with the Tan, which will prevent the Tan from heating. These Pits must not be less than 3 Feet deep, and 6 Feet in Width; the Length must be in Proportion to the Number of Plants they are to contain, but if they are not 10 Feet in Length, they will not retain their Heat long, for where there is not a good Body of Tan, the Outside of the Bed will soon lose its Heat, so that the Plants, which are there plunged, will have no Benefit of the Warmth, nor will the Middle of these Beds retain their Heat long, so that they will not answer the Purpose for which they are intended.

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When the Tan is put into the Bed, it must not be beaten or trodden down too close, for that will cause it to adhere, and form one solid Lump, so that it will not acquire a proper Heat; nor should it be trodden down at the Time when the Pots are plunged into the Beds, to avoid which there should be a Board laid cross the Bed, which should be supported at each End, to prevent its resting upon the Tan, upon which the Person should stand, who plunges the Pots, so that the Tan will not be pressed down too close. When the Tan is quite fresh, and has not been out of the Pits long enough to acquire a Heat, the Beds will require a Fortnight or three Weeks Time, or sometimes a Month, before they will be of a proper Temperature of Warmth to receive them; but in order to judge of this, there should be 3 or 4 Sticks thrust down into the Tan, about 18 Inches deep, in different Parts of the Bed, so that by drawing out the Sticks, and feeling them at different Depths, it will be easy to judge of the Temper of the Bed, and it will be proper to let a few of these Sticks remain in the Bed, after the Plants are plunged, in order to know the Warmth of the Tan, which may be better judged off by feeling these Sticks, than by drawing out the Pots, or plunging the Hand into the Tan.

When the Tan is good, one of these Beds will retain a proper Degree of Heat for near 3 Months, and when the Heat declines, if the Tan is forked up, and turned over, and some new Tan added to it, the Heat will renew again, and will continue 2 Months longer; so that by turning over the Tan, and adding some new Tan every 2 Months, or thereabouts, as the Bed is found to decline of its Heat, they may be continued one Year, but every Autumn it will be proper to take out a good Quantity of the old Tan, and to add as much new to the Bed, that the Heat of the Bed may be kept up in Winter, for if the Heat is suffered to decline too much during the cold Season, the Plants will suffer greatly; to prevent this, there should always be some new Tan added to the Bed in Winter, when the Heat is found to decline; but the Tan should be laid in a dry Place a Week or ten Days, to dry, before it is put into the Bed, otherwise the Moisture will chill the old Tan in the Bed, and prevent the Fermentation; so that unless the Tan is turned over again, there will be little or no Heat in the Beds, which often proves fatal to the Plants plunged in them; therefore whoever has the Management of these Beds should be very careful to observe constantly the Warmth of the Tan, since, upon keeping the Beds in a due Temperature of Warmth, their whole Success depends, and where this Caution is not taken, it frequently happens that the Ananas Plants run into Fruit very small, or the Plants are infested by Insects, both which are occasioned by the Growth of the Plants being stopped by the Decline of the Heat of the Tan.

The great Advantages, which these Tan Beds have of those made of Horse Dung, are the moderate Degree of Heat which they acquire, for their Heat is never so violent as that of Horse Dung, and they continue this Heat much longer, and when the Heat declines, it may be renewed, by turning the Beds over, and mixing some new Tan with the old, which cannot be so well done with Horse Dung, and likewise the Beds will not produce so great Steams, which are often injurious to tender

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Plants, so that these Tan Beds are much preferable to those of Horse Dung for most Purposes.

Tan, when it is well rotted, is also an excellent Manure for cold and stiff Lands, and if it is laid on Grass Ground in Autumn, that the Rains in Winter may wash it into the Ground, it will greatly improve the Grass, but when it is used new, or in the Spring of the Year, when dry Weather comes, it is apt to cause the Grass to burn, which has occasioned the Disuse of Tan in many Places, but if properly used, it will be found an excellent Dressing for all stiff Lands.

TAPIA. See Crateva.

TARCONANTHUS. *Lin. Gen. Pl.* 846.

The Characters are,

It has a Flower composed of several hermaphrodite Florets included in 1 common Top-shaped Empalement, which is short, permanent, and hairy. The Florets are uniform, funnel-shaped, and of 1 Petal indented in 5 Parts at the Top; they have each 5 very short Hair-like Stamina terminated by cylindrical tubulous Summits longer than the Petal, and an oblong Germen, supporting a Style the Length of the Stamina crowned by 2 Awl-shaped Stigmas which open Lengthways. The Germen turns to a single oblong Seed, crowned with Down, which ripens in the Empalement.

We have but one Species of this Genus, viz.

TARCONANTHUS. *Hort. Cliff.* 398. This is the *Coryza Africana*, frutescens, foliis *Salviae* odore *camphorae*. *Tourn. Inst.* 455. Shrubby African Fleabane with Sage Leaves smelling like Camphire.

This Plant grows naturally at the Cape of Good Hope; it has a strong woody Stalk, which rises to the Height of 12 or 14 Feet, and, sending out many ligneous Branches at the Top, may be trained up to a regular Head. The Branches are garnished with Leaves, in Shape like those of the broad-leaved Sallow, having a downy Surface like those of Sage, and their under Sides are white; these resemble in Smell the Rosemary Leaves when bruised. The Flowers are produced in Spikes at the Extremity of the Shoots, which are of a dull purple Colour, so do not make any great Appearance. The usual Time of its flowering is in Autumn; they continue great Part of Winter, but are not succeeded by Seeds here. These Plants are preserved to make a Variety in the Green-house, during the Winter Season, by those who are curious in collecting of foreign Plants; they retain their Leaves all the Year.

It is too tender to live through the Winter in the open Air in England, but requires no artificial Heat, therefore may be placed in a common Green-house with Myrtles, Oleanders, and other hardy exoticks in Winter, and in Summer may be exposed with them in the open Air, and treated as they are.

It may be propagated by Cuttings, which should be planted in May, in Pots filled with light Earth, and if they are plunged into a moderate hot Bed, it will promote their putting out Roots. These should be shaded with Mats, or covered with oiled Paper, to screen them from the Sun until they are rooted, and they must be duly watered. By the Middle of July these Cuttings will have taken Root, when they should be each transplanted into a separate Pot, and placed in the Shade until they have taken new Root; after which Time they may be placed with other hardy exotick Plants in a sheltered

sheltered Situation, where they may remain till the Middle or End of *October*, when they should be removed into the Green-house, placing them where they may have a large Share of Air in mild Weather. This Plant is very thirsty, so must be often watered, and every Year the Plants must be shifted, and, as they increase in Size, should be put into larger Pots.

TARRAGON. See *Abrotanum*.

TAXUS. *Tourn. Inst. R. H. 589. Tab. 362. Lin. Gen. Pl. 1006.* The Yew Tree; in French, *If*.

The Characters are,

The male Flowers are produced on separate Trees from the Fruit for the most part; they have neither Empalement or Petals, but the Gem is like a four-leaved Cover; they have a great Number of Stamina, joined at the Bottom in a Column longer than the Gem, terminated by depressed Summits, having obtuse Borders and 8 Points, opening on each Side their Base, and casting their Farina. The female Flowers are like the male, having no Empalement or Petals, but have an oval acute-pointed Germen, but no Style, crowned by an obtuse Stigma. The Germen becomes a Berry lengthened from the Receptacle globular at the Top, and covered by a proper Coat at Bottom, open at the Top, full of Juice, and of a red Colour, but, as it dries, wastes away, including 1 oblong oval Seed whose Top without the Berry is prominent.

We have but one Species of this Plant in England, viz.

TAXUS foliis approximatis. *Lin. Sp. Pl. 1040.* Yew Tree with Leaves growing near each other, or the common Yew.

This Tree grows naturally in England, and also in most of the northern Countries of Europe, and in North America, and where it is suffered to grow, will rise to a good Height, and have very large Stems; it naturally sends out Branches on every Side, which spread out, and are almost horizontal; these are closely garnished with narrow, stiff, blunt-pointed Leaves of a very dark green. The Flowers come out from the Side of the Branches in Clusters, the male Flowers having many Stamina are more conspicuous than the female; these for the most Part are upon different Trees, but sometimes are on the same Tree; they appear the latter End of May, and the Berries ripen in Autumn.

There is hardly any Sort of ever-green Tree, which has been so generally cultivated in the English Gardens as the Yew, on Account of it being so tonsile, as to be with Ease reduced into any Shape the Owner pleased, and it may be too often seen, especially in old Gardens, what a wretched Taste of Gardening prevailed formerly in England, from the monstrous figures of Beasts &c. we find these Trees reduced into, but of late this Taste has been justly exploded.

The only Use this Tree is fit for in Gardens, is to form Hedges for the Defence of exotick Plants, for which Purpose, it is the most proper of any Tree in being; the Leaves being small, the Branches are produced very closely together; and if carefully shorn, they may be rendered so close, as to break the Winds better than any other Sort of Fence whatever, because they will not be reverberated, as against Walls, Pales, and other close Fences.

These Trees may be easily propagated by sowing

their Berries in Autumn, as soon as they are ripe (without clearing them from the Pulp which surrounds them, as hath been frequently directed,) upon a shady Bed of fresh undunged Soil, covering them over about half an Inch thick with the same Earth.

In Spring the Bed must be carefully cleared from Weeds; and if the Season prove dry, it will be proper to refresh the Bed with Water now and then, which will promote the Growth of the Seeds; many of which will come up the same Spring, but others will remain in the Ground until Autumn or Spring following; but where the Seeds are preserved above Ground till Spring before they are sown, the Plants never come up till the Year after, so that by sowing the Seeds as soon as they are ripe, there is often a whole Year saved.

These Plants, when they come up, should be constantly cleared from Weeds, which if permitted to grow among them, would cause their Bottoms to be naked, and frequently destroy the Plants when they continue long undisturbed.

In this Bed the Plants may remain 2 Years, after which, in Autumn, there should be a Spot of fresh undunged Soil prepared, into which they should be removed the Beginning of *October*, planting them in Beds about 4 or 5 Feet wide, in Rows about a Foot asunder, and 6 Inches Distance from each other in the Rows, observing to lay a little Mulch on the Surface of the Ground about their Roots, and to water them in dry Weather until they have taken Root, after which they will require no farther Care, but to keep them clear from Weeds in Summer, and to trim them according to the Purpose for which they are designed.

In these Beds they may remain 2 or 3 Years, according as they have grown, when they should again be removed into a Nursery, placing them in Rows at 3 Feet Distance, and 18 Inches asunder in the Rows; observing to do it in Autumn, as was before directed, and continue to trim them in the Summer Season, according to the Design for which they were intended, and after they have continued 3 or 4 Years in this Nursery, they may be transplanted where they are to remain; always observing to remove them in Autumn where the Ground is very dry; but on cold moist Land it is better in the Spring.

These Trees are very slow in growing, yet there are many very large Trees on some barren cold Soils, in divers Parts of England. The Timber of these Trees is greatly esteemed for many Uses.

TELEPHIOIDES. See *Andrachne*.

TELEPHIUM, *Tourn. Inst. R. H. 248. Tab. 128. Lin. Gen. Pl. 339.* Orpine.

The Characters are,

The Empalement of the Flower is permanent, composed of 5 oblong oval Leaves which are obtuse, and the Length of the Petals. The Flower has 5 oblong obtuse Petals, and 5 Awl-shaped Stamina, shorter than the Petals, terminated by prostrate Summits, with a three cornered acute Germen, having no Style, crowned by 3 acute spreading Stigmas. The Germen turns to a short three-cornered Capsule with 1 Cell, opening with 3 Valves containing many round Seeds.

We have but one Species of this Genus, in the English Gardens;

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TELEPHIUM. *Hort. Up. 70.* Orpine, or Live long. This is the *Telebium legitimum Imperati. Clus. Hist. 77.* The true Orpine of *Imperatus*.

This Plant grows naturally in the South of *France* and *Italy*. The Root is composed of ligneous Fibres of a yellowish Colour, which spread out wide. The Branches or Stalks are slender and trail on the Ground; they are 8 or 9 Inches long, and are garnished with small oval Leaves of a grayish Colour, smooth, and pretty stiff, ranged alternately along the Stalk, having one longitudinal Nerve running through the Middle. The Flowers are produced at the End of the Branches in short thick Spikes reflexed like those of the *Heliotropium*. The Flowers are composed of 5 white Petals which spread open and are the Length of the Empalement, having 5 very slender Stamina, terminated by yellow Summits. This Plant flowers in *June* and *July*, and the Seeds ripen in Autumn.

This may be propagated by Seeds, which should be sown in Autumn, on a Bed of fresh light Earth, in an open Situation, for if they are sown in the Spring, the Plants will not come up till the following Spring. When the Plants are come up, they should be thinned, so as to leave them 6 or 8 Inches asunder, and they must be constantly kept clear from Weeds, for if they are permitted to grow, they will soon overbear the Plants, and destroy them. These Plants do not transplant well, so should stand in the Place where they were sown. In the Summer they will flower, and the Seeds will ripen in Autumn, which will scatter soon if not gathered when ripe; and, if the Ground is not disturbed, the Plants will come up in Plenty, and require no other Care than to keep them clear from Weeds.

TEREBINTHUS. See *Pistachia*.

TERGIFÆTUS PLANTS are such as bear their Seeds on the Backsides of their Leaves.

TERNATEA. See *Clitoria*.

TERRACES. A Terrace is a Bank of Earth, raised on a proper Elevation, so that any Person who walks round a Garden, may have a better Prospect of all that lies round him; and these Elevations are so necessary that those Gardens that have them not, are deficient.

When the Terraces are rightly situated, they are great Ornaments for their Regularity and Opening, especially when they are well made, and their Ascent not too steep.

There are several Kinds of Terrace Walks:

1. The great Terrace, which generally lies next to the House.
2. The Side or Middle Terrace, which is commonly raised above the Level of the Parterre, Lawn, &c.
3. Those Terraces which encompass a Garden.

As to the Breadth of Side Terraces, this is usually decided by its Correspondence with some Pavilion, or some little Jettye or Building; but most of all by the Quantity of Stuff that is to spare for those Purposes.

The Side Terrace of a Garden ought not to be less than 20 Feet, and but very seldom wider than forty.

As for the Height of a Terrace, some allow it to be but 5 Feet high; but others more or less, according to their Fancies; but more exact Persons never allow a

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bove 5 or 6 Feet; and in a small Garden, and a narrow Terrace Walk, 3 Feet; and sometimes 3 Feet and a Half high are sufficient for a Terrace 18 Feet wide; and 4 Feet are sufficient for a Terrace of 20 Feet wide; but when the Garden is proportionably large, and the Terrace is 30 or 40 Feet wide, then it must be at least 5 or 6 Feet high.

The noblest Terrace is very deficient without Shade; for which Elm Trees are very proper; for no Seat can be said to be complete, where there is not an immediate Shade almost as soon as out of the House, and therefore these shady Trees should be detached from the Body and Wings of the Edifice.

TERRENE, Earthy, or composed of Earth.

TERRESTRIAL, Earthy, or that belongs to Earth.

TETRACERA, *Liv. Gen. Pl. 604.*

The Characters are,

The Flower has a permanent Empalement of 6 roundish spreading Leaves, the 3 outer are alternate and smaller than the other; it has 6 small Petals which soon fall off, and a great Number of Stamina which are permanent, and the Length of the Empalement, terminated by single Summits; it has 4 oval Germina supporting a short Awl-shaped Style, crowned by an obtuse Stigma. The Germina become 4 oval reflexed Capsules, each having 1 Cell opening at the Seam on the upper Side, inclosing 1 roundish Seed.

We have but one Species of this Genus, viz.

TETRACERA. *Hort. Cliff. 214.* This is the *Petræa floribus spicatis, foliis lauri scabris. Amman. Herb. 518.* *Petræa* with spiked Flowers and rough Leaves resembling those of the Bay Tree.

This Plant grows naturally at *La Vera Cruz*, where it was discovered by the late Dr. *Houssoun*, who sent it to *England*. It has a woody Stalk which rises 12 or 14 Feet High, covered with a gray Bark, sending out several slender ligneous Branches which twine about any neighbouring Support; they are garnished with oblong oval Leaves, whose Surfaces are very rough; they are near 6 Inches long, and 2 and a Half broad, slightly indented on their Edges toward their Points, and have many transverse Veins running from the Mid-rib to the Edges; they are placed alternate on the Branches, standing on short Foot Stalks, of a grayish Colour on their upper Surface, and brown on their under. The Flowers are produced in Panicles at the End of the Branches; these Panicles are composed of 3 or 4 short thick Spikes which branch out from the lower Part of the principal Spike, which is much longer and thicker than the other. The Flowers have 6 thin purple Petals, the same Length as the Empalement, which are very fugacious, so that they soon fall off; these sit upon the Germina. After the Flowers are past, the 4 Germina become so many oval Capsules reflexed backward; these open Lengthways on the upper Side, and have each 1 oblong Seed enclosed.

This Shrub is very different from that which Dr. *Plukenet* titles *Fagus Americanus ulmi amplifolius foliis, capsulis bigemellis. Amaltb. 87.* though Dr. *Linnaeus* has added this Synonyme to it.

This is propagated by Seeds, which must be procured from the Countries where the Plant naturally grows, which

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which may probably be found in some of the *British Islands in the West-Indies*. I have received it from the Island of *Barbuda*, where it was found by the late Dr. *Cressy*, who sent me Specimens and Seeds. These Seeds are frequently abortive, for, upon examining them, there was scarce more than a twentieth Part which had any Kernels, the others appeared fair but were hollow. The Seeds should be sown in Pots filled with light Earth, and plunged into a moderate hot Bed of Tanners Bark, where they must be treated as other exotick Seeds from the same Countries, and as the Plants seldom come up the same Year, the Pots should be removed into the Stove before Winter, and plunged into the Tan Bed, between the other Pots of Plants, where they should remain till Spring, when they should be taken out and plunged into a fresh hot Bed of Tanners Bark, which will bring up the Plants if the Seeds were good. When the Plants are fit to remove, they should be each planted in a separate small Pot filled with light Earth, and plunged into a good Bed of Tan, shading them from the Sun till they have taken new Root, after which their Treatment must be the same as for the *Annona*, and the like tender exotick Plants, which require to be kept always in the Tan Bed.

TETRAGONIA. Lin. Gen. Pl. 551. *Tetragonocarpus*. Boerb. Ind. Alt. 262.

The Characters are,

The Flower has a permanent coloured Empalement, composed of 4 oval, plain, diflexed Leaves, sitting upon the Germen. It has no Petals, but about 20 Hair-like Stamina, shorter than the Empalement, terminated by oblong prostrate Summits, and a roundish four-cornered Germen under the Flower, supporting 4 Awl-shaped Styles recurved and as long as the Stamina, with hairy Stigmas the Length of the Styles. The Germen becomes a thick Capsule with 4 Cells, having 4 Angles which have narrow Wings or Borders, containing 1 hard oblong Seed in each.

The Species are,

1. **TETRAGONIA** foliis linearibus. Flor. Leyd. Prod. 250. *Tetragonia* with linear Leaves. *Tetragonocarpus Africana fruticans, foliis longis & angustis*. H. Amst. 2. p. 205. African shrubby *Tetragonocarpus*, with long narrow Leaves.

2. **TETRAGONIA** foliis ovatis integerrimis, caule fruticoso decumbente. *Tetragonia* with oval entire Leaves, and a shrubby trailing Stalk.

3. **TETRAGONIA** foliis ovatis. Flor. Leyd. Prod. 250. *Tetragonia* with oval Leaves. *Tetragonocarpus Africana, radice magna crassa & carnosa*. Hort. Amst. 2. p. 203. *Tetragonocarpus* with a large fleshy Root, and oval Leaves.

These Plants grow naturally at the *Cape of Good Hope*, from whence they were first brought to the Gardens in *Holland*. The first Sort has slender ligneous Stalks which rise 3 or 4 Feet high, if they are supported, otherwise they trail on the Ground; they are covered with a light gray Bark, and divide into a great Number of trailing Branches, which when young are succulent, of an herbaceous Colour, and covered with small pellucid Drops, somewhat like the Diamond *Ficoides*, which reflect the Light. As the Branches are older they become more ligneous; they are garnished with

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thick, succulent narrow Leaves, about half an Inch long, and a Tenth of an Inch broad, concave, and blunt-pointed; these are placed alternate, and at their Base come out a Cluster of smaller Leaves, they have the like pellucid Drops as the Stalks. The Flowers are produced from the Wings of the Stalks, at every Joint toward the End of the Branches, sometimes they come singly, at others there are two, and sometimes 3 Flowers at each Joint; these have Empalements of 5 Leaves, which spread open and are a little reflexed; they are green without, and yellow within, each having about 40 Stamina terminated by oblong prostrate Summits, which fill up the Middle of the Flower. They appear in *July* and *August*, and are succeeded by large four-cornered Capsules, having 4 Wings or Borders, and 4 Cells, each containing 1 oblong Seed, which ripens in Winter.

The 2d Sort has larger Stalks than the former, which branch out in like Manner; the Branches trail on the Ground where they are not supported; the young Branches are very succulent, and almost as thick as a Man's little Finger; the Leaves are 2 Inches long, and 1 broad, their Surface are covered with very small pellucid Drops, as are the Stalks. The Flowers are larger and stand on pretty long Foot Stalks, 3 or 4 arising from the same Points; the Empalement, and also the Summits are of a pale Sulphur Colour. It flowers at the same Time with the first.

These may be propagated by Cuttings, which should be cut off from the Plants a few Days before they are planted, that the Part where they are cut may be healed, otherwise they will rot; for the Leaves and Stalks of this Plant are very full of Moisture. The best Time to plant these Cuttings is in *July*, that they may have Time to make good Roots before Winter. These Cuttings may be planted on a Bed of fresh Earth; and if they are shaded from the Sun in the Heat of the Day, it will be of Service to them. They should be frequently refreshed with Water; but they must not have it in too great Plenty, for that will rot them. In about 6 Weeks after planting, the Cuttings will be sufficiently rooted to transplant, therefore they should be taken up, and planted into Pots filled with light fresh undunged Earth, and placed in a shady Situation, until they have taken new Root, after which Time they may be placed with other hardy exotick Plants, in a sheltered Situation, where they may remain till the Middle or latter End of *October*, at which Time they should be removed into the Green-house, and placed where they may enjoy as much free Air as possible in mild Weather; for they only require to be protected from the Frost, being pretty hardy with Respect to Cold; but they should not have too much Moisture in Winter. If these Plants are planted in the full Ground in the Summer Season, they will grow prodigiously rank and large, as they also will, if they are permitted to root into the Ground through the Holes at the Bottom of the Pots; therefore the Pots should be frequently removed to prevent it, for when they grow too freely, their Leaves will be very full of Moisture; which, together with the Weight of the Fruit, which are always produced at the Extremity of the Branches, will weigh the Branches upon the Ground, and render the Plants

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very unsightly. The Plants of this Kind commonly grow very straggling; therefore the more their Roots are confined in the Pots, the more close and stunted will be the Heads of the Plants; which is what they should always be kept to, in order to render them fightly. The Flowers of this Plant have no great Beauty, but as the whole Face of the Plant is peculiar, it may be allowed a Place in every Collection of Plants for Variety, since it requires no great Trouble to cultivate it.

These Plants may also be propagated by Seeds, which should be sown on a warm Border of light fresh Earth, where sometimes they will remain a whole Year before the Plants come up; therefore when they do not come up the first Season, the Borders should not be disturbed, but kept constantly clear from Weeds; and when the Plants are come up about 4 Inches high, they should be taken up and planted in Pots, (and treated as hath been directed for the Cuttings;) for if they are suffered to grow in the Border till they are large, they will not transplant so well, nor will they make so handsome Plants.

The 3d Sort hath large fleshy Roots; the Branches are weak, and trail on the Ground; these generally decay about Midsummer, and new Shoots are produced late in Autumn. The Leaves of this come out in Bunches, they are oval, plain, and not so thick and succulent as those of the other Sorts; they are a little more than an Inch long, and half an Inch broad. The Flowers are produced from the Wings of the Leaves in February; These are like those of the second Sort and have pretty long slender Foot Stalks. This never produces any Seeds in England, however the Cuttings will grow, if they are planted early in the Spring; so that the Sort may be propagated with the same Facility as either of the other Kinds.

All these Sorts require Protection in Winter; but if they are placed in an airy Glass Case with Ficoides, and other hardy Plants, where they may have a large Share of free Air in mild Weather, and protected from the Frost, they will thrive much better than when they are more tenderly treated.

TETRAGONOTHECA. Hort. Elth. 283. Lin. Gen. Pl. 875. Sun Flower, vulgo.

The Characters are,

The Flower is composed of hermaphrodite and female Florets, included in 1 large common Empalement cut into 4 plain, triangular, Heart-shaped Segments which spread open. The Disk or Middle of the Flower is made up of hermaphrodite Florets, Funnel-shaped and cut into 5 Parts at the Brim, and reflexed; they have 5 short Hair-like Stamina, terminated by cylindrical Summits, and a naked Germen supporting a slender Style, crowned by 2 reflexed Stigmas. The Germen becomes 1 naked roundish Seed. The female half Florets which compose the Ray or Border of the Flower, have their Petals stretched out like a Tongue on one Side, and are cut at their Points into 3 equal acute Parts. These have no Stamina, but a naked Germen supporting a slender Style with 2 twisted Stigmas, succeeded by single naked Seeds.

We have but one Species of this Genus. viz.

TETRAGONOTHECA. Lin. Sp. Pl. 903. This is the *Tetragonotheca doronicii maximi folio.* Hort. Elth.

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378. Dwarf Sun Flower, with a Leaf like the greater Leopard's Bane.

This Plant is a Native of *Carolina*, from whence the Seeds were brought to *Europe*. The Roots of this Plant are perennial, but the Stalks are annual, and perish in Autumn on the Approach of Cold. The Roots will abide through the Winter in the full Ground, if planted in a warm Situation; so do not require any Shelter, except in very severe Winters; when, if they are covered over with rotten Tan, or Peas Haulm, to keep out the Frost, there will be no Danger of their being killed.

About the latter End of *April*, or Beginning of *May*, the Roots will send forth new Shoots, which are garnished with large, oblong, rough Leaves, placed by Pairs closely embracing the Stalks; these are a little sinuated on their Edges, and covered with small Hairs. The Stalks usually grow about 2 Feet high in *England*, and branch out toward the Top into several smaller Stalks, each having 1 large yellow Flower at their Top shaped like a Sun Flower; which, before it expands, is covered with the inflated Empalement, which is four-cornered. The Seeds of this Plant rarely ripen in *England*, but when they are obtained from Abroad, they should be sown in the full Ground in the Spring of the Year; where, sometimes they will remain a Year before the Plants come up, so that if they do not come up the same Year, the Ground should not be disturbed, but kept clean from Weeds, and wait till the 2d Year to see what Plants will come up. When the Plants appear, they must be kept clean from Weeds, and if the Season should prove dry, they will require to be frequently watered. In Autumn the Plants should be transplanted into the Places where they are to remain.

These Plants will live 3 Years in a proper Soil and Situation, but as it does not increase here, the best Method is, to procure good Seeds from Abroad annually.

A **TETRAPETALOUS FLOWER** is one composed of only 4 single Flower Leaves, called *Petala*.

TEUCRIUM. Lin. Gen. Pl. 625. Tourn. Inst. R. H. 207. Tab. 93. Tree Germander.

The Characters are,

The Empalement of the Flowers is of 1 Leaf, cut into 5 acute equal Segments at the Top, and is permanent. The Flower is of the Lip Kind with 1 Petal, having a short cylindrical Tube a little incurved at the Chaps. The upper Lip is erect and deeply cut into 2 acute Segments. The lower Lip spreads and is cut into 3 Segments, the Middle one is large and roundish, the 2 Side ones are acute and erect. It has 4 Awl-shaped Stamina longer than the upper Lip and prominent between the Segments, terminated by small Summits. It has a Germen divided in 4 Parts, supporting a slender Style, crowned by two slender Stigmas. The Germen afterward turns to 4 roundish naked Seeds which ripen in the Empalement.

The Species are,

1. **TEUCRIUM** foliis cordatis undulatis obtuse serratis floralibus integerrimis concavis, caule fruticoso. Lin. Sp. Pl. 565. Tree Germander with Heart-shaped waved Leaves bluntly sawed, those between the Flowers concave and entire, and a shrubby Stalk. *Teucrium multis.* J. B. Common Tree Germander.

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2. *TEUCRIUM foliis ovatis crenatis, floralibus lanceolatis integerrimis, caule fruticoso.* Tree Germander with oval crenated Leaves, those between the Flowers Spear-shaped and entire, and a shrubby Stalk. *Chamaedrys Alpina frutescens, folio splendens.* Tourn. Inst. R. H. 205. Shrubby Alpine Tree Germander with shining Leaves.

3. *TEUCRIUM foliis integerrimis oblongo-ovatis petiolatis, supra glabris, subtus tomentosis.* Lin. Sp. Pl. 563. Tree Germander with entire, oblong, oval Leaves having Foot Stalks, and being smooth above, and hoary underneath. *Teucrium fruticans Baticum.* Clus. Hist.

1. p. 348. Spanish Tree Germander.

4. *TEUCRIUM foliis integerrimis, rhombeis, acutis, villosis, subtus tomentosis.* Hort. Ups. 195. Tree Germander with entire Leaves which are hairy, shaped like an acute Rhombus, and woolly on their under Side. *Teucrium Hispanicum latiore folio.* Tourn. Inst. 208. Spanish Tree Germander with a broader Leaf.

5. *TEUCRIUM foliis multifidis, floribus solitariis.* Lin. Sp. Pl. 562. Germander with many-pointed Leaves, and Flowers growing singly. *Teucrium Hispanicum supinum humilius, verbenae tenuifoliae foliis.* Jussieu. Low trailing Spanish Germander with Leaves like those of the narrow-leaved Vervain.

6. *TEUCRIUM foliis multifidis, floribus verticillatis utrinque ternis.* Lin. Sp. Pl. 562. Germander with many pointed Leaves, and Flowers growing in Whorls by Threes. *Chamaedrys foliis laciniatis.* Lob. Observ. 209. Germander with jagged Leaves.

7. *TEUCRIUM foliis ovatis inciso-crenatis petiolatis, floribus subverticillatis.* Hort. Cliff. 302. Germander with oval Leaves with crenated Cuts, having Foot Stalks, and Flowers growing almost in Whorls. *Chamaedrys minor repens.* C. B. P. 248. Smaller Creeping Germander.

8. *TEUCRIUM foliis ovatis utrinque acutis, superne serrato-dentatis, floribus racemosis.* Flor. Leyd. Prod. 307. Germander with oval Leaves pointed at both Ends, and Saw-indented toward their Points, and Flowers growing in Bunches. *Chamaedrys multiflora, tenuifolia Hispanica.* Tourn. Inst. 205. Spanish narrow-leaved Germander bearing many Flowers.

9. *TEUCRIUM foliis oblongo-ovatis inciso-crenatis acuminate, floribus subverticillatis.* Germander with oblong oval Leaves acute-pointed, jagged, and crenated, and Flowers growing almost in Whorls. *Chamaedrys major repens.* C. B. P. 248. Greater creeping Germander.

10. *TEUCRIUM foliis ovatis tomentosis, obtuse crenatis, floralibus integerrimis, calycibus aculeatis.* *Teucrium* with oval woolly Leaves obtusely crenated, those among the Flowers entire, and the Empalements of the Flowers ending in acute Points. *Teucrium Creticum odoratum flore purpureo.* H. R. Par. Sweet-smelling Germander of Crete with a purple Flower.

11. *TEUCRIUM foliis oblongo-ovatis superne serratis villosis, subtus incanis sessilibus, floribus subverticillatis.* *Teucrium* with oblong oval Leaves sawed toward their Points, hairy, and hoary on their under Side, sitting close to the Branches, and Flowers growing almost in Whorls. *Chamaedrys Alpina villosa.* Tourn. Inst. 205. Hoary Alpine Germander.

12. *TEUCRIUM foliis cordatis serratis petiolatis, ra-*

cemis lateralibus secundis, caule erecto. Lin. Sp. Pl. 564. Germander with Heart-shaped sawed Leaves having Foot Stalks, many long Bunches of Flowers growing from the Wings, and an upright Stalk. *Scordium alterum sive salvia agrestis.* C. B. P. 247. Another *Scordium* or wild Sage.

13. *TEUCRIUM foliis oblongis sessilibus dentato-serratis, floribus geminis axillaribus, caule diffuso.* Lin. Sp. Pl. 565. Germander with oblong Saw-indented Leaves sitting close to the Branches, and Flowers growing by Pairs at the Wings of the Stalk which is diffused. *Scordium.* C. B. P. 247. Water Germander.

14. *TEUCRIUM foliis integerrimis ovatis utrinque acutis, racemis secundis villosis.* Lin. Sp. Pl. 564. Germander with oval entire Leaves pointed at both Ends, and hairy Bunches of Flowers. *Marum Syriacum vulgo Flor. Bat. 2. 84.* Syrian Mastick, or common *Marum*.

15. *TEUCRIUM foliis trifidis linearibus integerrimis, floribus sessilibus axillaribus.* Hort. Upsal. 160. Germander with linear, trifid, entire Leaves, and Flowers sitting close, growing out of the Wings of the Branches. *Chamaepitys lutea vulgaris, sive folio trifido.* C. B. P. 249. Common yellow Ground Pine having a trifid Leaf.

16. *TEUCRIUM foliis linearibus villosissimis superne dentatis, floribus sessilibus.* Germander with the most hairy linear Leaves indented toward their Points, and Flowers sitting close to the Wings of the Stalk. *Chamaepitys moschata, foliis serratis, an prima Dioscoridis?* C. B. P. 249. Musk Ground Pine with sawed Leaves, and probably the first of *Dioscorides*.

17. *TEUCRIUM foliis linearibus tomentosis integerrimis, floribus sessilibus.* Germander with linear, woolly, entire Leaves, and Flowers sitting close to the Branches. *Chamaepitys moschata, foliis non serratis.* Allion. Musk Ground Pine with Leaves not sawed.

18. *TEUCRIUM foliis oblongo-ovatis obtuse dentatis, floribus solitariis alaribus pedunculatis, calycibus acutis.* Germander with oblong oval Leaves bluntly indented, Flowers placed singly at the Wings of the Stalks, and acute Empalements. *Teucrium Americanum Chamaedrys folio, flore albo.* Houst. Mss. American *Teucrium* with a Germander Leaf and white Flower.

19. *TEUCRIUM foliis ovato-lanceolatis, inaequaliter serratis, racemis alaribus terminalibusque calycibus inflatis.* Germander with oval Spear-shaped Leaves unequally sawed, long Bunches of Flowers springing from the Wings, and terminating the Stalks, and inflated Empalements. *Chamaedrys Americana, maxima, catariae folio, calyce vescario.* Houst. Mss. Greatest American Germander with a Catmint Leaf, and a bladdered Empalement.

The 1st Sort grows naturally in the South of France, in Spain, and in Italy; it rises with a shrubby Stalk, near 2 Feet high, sending out many ligneous Branches, garnished with Heart-shaped Leaves, a little waved, bluntly sawed on their Edges, a little more than an Inch long, and three Quarters broad near their Base, of a lucid green on their upper Side, but a little hoary on their under, standing on short Foot Stalks. The upper Part of the Branches for 6 or 8 Inches in Length is adorned with Flowers, which come out from the Wings of the Stalk, 2 or 3 standing on each Side at every Joint; they are of a dirty white Colour, and

stand on slender Foot Stalks; under each of these Whorls stand 2 smaller Leaves, which are entire and concave. The Flowers appear in *July*, and the Seeds ripen in Autumn.

This Sort was formerly preserved in Green-houses with great Care, but of late Years it hath been planted out into the full Ground, and is found hardy enough to endure the Cold of our severest Winters without Shelter, provided it be planted on a dry Soil.

This may be propagated by planting Cuttings in the Spring, on a Bed of fresh light Earth, observing to shade and water them until they have taken Root; after which they will require no farther Care, but to keep them clear from Weeds, until the following Autumn, when they may be transplanted out into the Places where they are to remain, being very careful in removing them not to shake off all the Earth from their Roots, as also to water them, if the Season should prove dry, until they have taken fresh Root; after which the only Care they require, is to keep the Ground clean about them, and to prune off such Shoots as are ill situated, whereby their Heads will appear more regular, and the flowering Branches when they decay.

It may also be propagated by Seeds, which generally are produced in Plenty. If these are sown on a Bed of light Earth in *April*, the Plants will come up in six Weeks after, and may be transplanted in Autumn where they are to remain.

The 2d Sort grows naturally on the *Alps*, but in the lower Parts, where the Cold is not very severe, and generally on moist Ground; this hath a shrubby Stalk like the former, and rises about the same Height, but branches out more than that. The Stalks are covered with a short hairy Down; the lower Leaves are oval, crenated, and of a lucid green on their upper Side, but a little hoary on their under; the Leaves between the Flowers are Spear-shaped and entire; the Spikes of Flowers are much longer; the Flowers are larger, and their Colour more inclining to a yellow than those of the former. This flowers at the same Time with the other, and may be propagated in the same Way.

The 3d Sort grows naturally in *Spain* and *Sicily*, near the Borders of the Sea; this has a shrubby branching Stalk, which rises 6 or 8 Feet high, covered with a hoary Bark. The Branches are garnished with small oval Leaves, placed opposite, sitting close to the Branches; they are near one Inch long, and half an Inch broad, smooth on their upper Side, of a lucid green, and their under Sides are hoary. The Flowers come out from the Wings of the Stalk at the upper Part of the Branches; they are single one on each Side at a Joint standing on short Foot Stalks; their Empalements are short and hoary. The middle Segment of the lower Lip is large, and indented at the Point; the Stamina are long-hooked, and supply the Place of the upper Lip; the Flowers are blue, and come in Succession great Part of Summer, but the Plants seldom produce good Seeds in *England*.

There is a Variety of this with variegated Leaves, preserved in some Gardens.

The 3d Sort is tenderer than the former, though this will endure the Cold of our ordinary Winters, if planted on a dry Soil, and in a warm Situation, but in a severe

hard Frost it is sometimes destroyed, for which Reason the Plants are often preserved in Pots, and removed into the Green-house in Winter. This is propagated by Cuttings as the former.

The 4th Sort grows naturally in *Spain*; this has a great Resemblance of the third, but the Branches spread more horizontally. The Leaves are sometimes Heart-shaped, and at others in Form of a Rhombus; the lower Leaves, which are the largest, are an Inch and a Half long, and three Quarters of an Inch broad; the upper are smaller, and of a different Shape; these are downy on both Sides, but the lower Leaves are only so on their under. The Flowers come out at the upper Parts of the Branches as the former, but are larger and of a paler blue Colour.

This is propagated as the other, and the Plants require the same Treatment.

The 5th Sort grows naturally in *Spain* and *Italy* on moist Ground. The Stalks of this are herbaceous, and trail on the Ground; they grow about a Foot in Length, and are garnished with deep green Leaves cut into many Points almost to the Midrib; they are smooth, and stand opposite. The Flowers come out on each Side the Stalks singly; they are white, and appear in *July*; these are each succeeded by 4 Seeds, which ripen in *September*.

This Plant is preserved in Botanick Gardens for Variety; it is propagated by Seeds which may be sown in the Spring in the Place where the Plants are to remain, and, when they come up, will require no other Culture but to thin them where they are too close, and keep them clean from Weeds. These Plants ripen their Seeds the first Year, but, if they are in a warm Situation, they will live through the Winter.

The 6th Sort grows naturally in the South of *France*, in *Italy* and *Germany* in the Corn Fields; this is an annual Plant which perishes soon after the Seeds are ripe. The Stalks are four-cornered and hairy; they grow about a Foot long, and are garnished at every Joint by Leaves placed opposite, which are hairy and cut almost to the Mid-rib, and the Segments are cut into three Points. The Flowers come out at the Wings of the Stalk in Whorls, 3 standing together on each Side on short Foot Stalks; they are white, and shaped like those of the other Species; they appear in *June* and *July*, and the Seeds ripen in *August* and *September*.

This is propagated by Seeds as the last, but if the Seeds of this are sown in Autumn, or permitted to scatter when ripe, they will succeed better than if sown in the Spring, and the Plants will come earlier to flower.

The 7th Sort grows naturally in the South of *France*, and in *Germany*; this has a creeping fibrous Root, which spreads in the Ground, and multiplies greatly, sending out many four-cornered hairy Stalks, 8 or 9 Inches long; these send out a few short Branches, garnished with oval Leaves about an Inch long, and three Quarters broad, deeply crenated on their Borders, and stand on short Foot Stalks; they are of a light green above, but hoary on their under Side. The Flowers grow from the Wings of the Stalks, toward the upper Part almost in Whorls, standing chiefly to one Side of the Stalk;

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Stalk; they are of a reddish Colour, the lower Lip turning upward. This Plant flowers in *June* and *July*, and the Seeds ripen in Autumn.

It is a perennial Plant, and propagates very fast by its creeping Roots, and will thrive in almost any Soil or Situation: The best Time to transplant it is in Autumn. This was a few Years since in great Request as a Specifick for the Gout, but is at present in little Esteem.

The 8th Sort grows naturally in *Spain*; this is a perennial Plant, having some Resemblance of the former, but the Roots do not creep. The Stalks are taller and more erect; the Leaves are narrower, pointed at both Ends, and not so deeply indented; the Indentures are sharper, and only toward their Points; the Stalks are garnished with Flowers great Part of their Length, which come out in Bunches at the Wings; they are longer than those of the former, and of a brighter red Colour. This Plant flowers about the same Time with the former.

It may be propagated by parting the Roots in Autumn, or by sowing the Seeds at the same Season, which will more certainly succeed than those sown in the Spring. It loves an open Situation exposed to the Sun, but will thrive in almost any Soil which is not too moist.

The 9th Sort grows naturally in *Italy*; this is like the 7th Sort, but the Stalks grow almost twice the Length of those, and send a greater Number of Branches. The Leaves of this are an Inch and a Half long, and three Quarters broad, and are more acutely indented on their Edges; they are hairy, of a light green on their upper Side, and hoary on their under. The Flowers grow almost in Whorls from the Wings of the Stalks, to which they sit very close; they are sometimes red, and at others white, and both Colours are often on the same Plant. This Sort flowers at the same Time as the former, and may be propagated the same Way.

The 10th Sort grows naturally in the Island of *Crete*, and also about *Nice* in *Italy*; this is a perennial Plant with a low shrubby Stalk, sending out many Branches which are four-cornered and woolly; these are garnished with oval Leaves about an Inch long, and three Quarters broad; they are woolly on both Sides, and bluntly crenated on their Borders. The upper Parts of the Branches are adorned with purple Flowers in Whorls, having 2 small oval entire Leaves under each Whorl; the Flowers are as large as those of the first Sort, but their Cups are very woolly, and their Indentures end in sharp Points. This flowers in *July*, and when the Season proves warm and dry, the Plants will produce good Seeds in *England*.

This may be propagated either by Seeds or Cuttings as the two first Sorts, but the Plants should have a dry Soil and a warm Situation, otherwise they will not live through the Winter in the open Air in *England*.

The 11th Sort grows naturally on the *Alps*; this is like the 7th Sort, but the Stalks and Leaves are very hairy, sawed toward their Points, hoary on their under Side, and sit close to the Branches. The Flowers are larger than those of the 7th Sort, and of a paler red Colour. It flowers in *June*, and the Seeds ripen in *August*.

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This may be propagated by Seeds or parting the Roots as the 7th.

The 12th Sort is the common wild or Wood Sage, which grows naturally in Woods and Thickets in many Parts of *England*, so is rarely admitted into Gardens; this has a creeping perennial Root, from which arise stiff, ligneous, four-cornered Stalks a Foot and a Half high, garnished at each Joint by two Heart-shaped Leaves placed opposite, which are slightly sawed on their Edges, and stand on Foot Stalks. The upper Part of the Stalks have 3 or 4 long Spikes of Flowers, which incline to one Side of the Stalk; they are of an herbaceous white Colour, and the Stamina are terminated by purple Summits. It flowers in *July*, and the Seeds ripen in Autumn. This Plant will grow in any Soil or Situation, and was formerly used in Medicine.

The 13th Sort is the common Water Germander, which grows naturally in the Isle of *Ely*, and some other fenny Parts of *England*; this has a small stringy fibrous creeping Root which is perennial, from which arise many four-cornered, trailing, diffused Stalks, garnished with oblong, hairy, indented Leaves, sitting close to the Stalks. The Flowers are produced at the Wings of the Stalks, two arising on each Side, at every Joint; they are of a purple Colour, and sit very close to the Bottom of the Leaves; these appear in *July*, but are seldom succeeded by Seeds. The whole Plant has an Odour like that of Garlick. The Herb is used in Medicine.

This Plant may be propagated by its creeping Roots, or planting the young Shoots in the Spring, as Mint, Penny Royal, &c. and should have a moist Soil, otherwise it will not thrive in Gardens.

The 14th Sort is the common or *Syrian Marum*, which grows naturally in *Syria*, and also in the Kingdom of *Valencia*; this has a low shrubby Stalk, sending out many slender ligneous Branches, which in warm Countries will rise 3 or 4 Feet high, but in *England* it is rarely seen half that Height. The Stalks are very hoary, and are garnished with small oval Leaves opposite at each Joint; these are about the Size of those of Thyme, and are pointed at both Ends; they are green above, and hoary underneath; they have a piercing grateful Scent, so quick as to cause Sneezing. The Flowers grow in loose whorled Spikes at the End of the Branches; they are very downy, and the Flowers are of a bright red Colour; they appear in *July* and *August*, but are not succeeded by Seeds in *England*.

This Plant is easily propagated by Slips or Cuttings, which, if planted during the Summer Months on a Bed of light loamy Earth, covering them down close either with Bell or Hand Glasses, and shading them from the Sun, will put out Roots very freely. When these have made good Roots, they may be transplanted either into separate small Pots, or on a warm Border at about 6 Inches Distance every Way, observing to shade them from the Sun, and supply them with Water till they have taken new Root; after which they will require no other Care, but to keep them clean from Weeds. These Plants will live through the Winter in the open Air, if planted in a dry Soil and a warm Situation, when the Frosts are not very severe; but in very hard Winters they are frequently killed, if not pro-

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protected by Mats or some other Covering. There was about 40 Years ago a great Number of these Plants growing in the warm Borders of the Royal Gardens at *Kensington*, which were clipped into conical Forms, and were near 3 Feet high, but now there are few Plants of a large Size to be found in the *English* Gardens, because their Branches are annually cut to keep them short.

The Cats are very fond of this Plant, and where there are but few of these Plants, will destroy them, unless they are protected from them; but, where there is a great Number of the Plants together, the Cats seldom touch them.

The 15th Sort is the common Ground Pine, which is used in Medicine; it grows naturally on chalky arable Land in several Parts of *England*; it is an annual Plant, with a single ligneous Root which strikes deep into the Ground, sending out a few slender Fibres from the Side, from which arise many weak trailing Stalks which are very hairy; these are garnished with narrow Leaves ending with three Points, which are set by Pairs and cross over each other at every Joint; they are hairy, and, when bruised, emit a strong resinous Odour. The Flowers sit close to the Stalks at the Wings of the Leaves; there are two or three of them at each Joint, of a bright yellow Colour, and shaped like the other Species; these appear in *July*, and the Seeds ripen in *September*. If these are permitted to scatter, the Plants will come up better than if sown, and require no other Care but to thin them and keep them clean from Weeds.

This Plant is greatly recommended for its Virtues; there is scarce a better Herb than this for opening Obstructions; it is a strong Diuretick, and an excellent Remedy for the Rheumatism.

The 16th Sort grows naturally in the South of *France*, in *Italy*, and *Spain*; it is an annual Plant, with a single ligneous Root sending out a few Fibres. The Stalks are about 6 Inches high, and are closely garnished with very hairy narrow Leaves which are indented toward their Points. The Flowers come out from the Wings of the Stalks to which they sit very close; they are large, of a bright purple Colour, and appear in *July*, but unless the Season proves favourable, they are not succeeded by Seeds in *England*.

The 17th Sort grows naturally about *Nice* in *Italy*, from whence it was sent me; this is also an annual Plant, much like the former, but the Leaves are narrower and entire. The whole Plant is covered with white woolly Hairs, and the Flowers are smaller than those of the former.

Both these Plants succeed best, if, when they perfect their Seeds, they are permitted to scatter in the same Manner as the 15th Sort, or if the Seeds are sown, it should be in Autumn, for they rarely succeed when sown in Spring.

The 18th Sort was discovered by the late Dr. *Houftoun*, growing naturally at *La Vera Cruz*; this is an annual Plant with an erect Stalk a Foot and a Half high; it is four-cornered and smooth, garnished with smooth oblong oval Leaves bluntly indented; they are about an Inch and a Half long, and three Quarters of an Inch broad, standing on short Foot Stalks. The Flowers come out from the Wings of the Stalks, 2 of them

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arising at each Joint, upon short slender Foot Stalks; they are small and white, having short Empalements cut at the Brim into 5 very acute Points. The Flowers appear in *July*, and are succeeded by Seeds which ripen in Autumn.

The 19th Sort was discovered by the late Dr. *Houftoun* at the same Place with the former; this is also an annual Plant, with a slender upright four-cornered Stalk, which rises 3 Feet high, and divides into several smooth Branches, garnished with oval Spear-shaped Leaves, 3 Inches long and 1 broad, of a bright green on their upper Side, but pale on their under; they are unequally sawed on their Edges, and stand on long Foot Stalks. The Flowers come out in long Bunches from the Wings of the Stalk and also at the Top; they are pretty large, white, and have bladdered Empalements; these appear late in *July*, and unless the Season proves favourable, they will have no good Seeds succeed them.

The 2 last Sorts are tender, so will not thrive in the open Air in *England*, and unless the Season proves warm, they will not perfect their Seeds here. The Seeds should be sown in small Pots in Autumn, which should be plunged into the Tan Bed in the Stove between the other Pots, where they should remain till Spring, and then they may be taken out, and plunged into a hot Bed, which will bring up the Plants. When these are fit to remove, they should be each planted in a separate Pot, and plunged into a hot Bed, and afterward treated as other tender Plants which require constant Shelter.

THALICTRUM. *Journ. Inst. R. H.* 270. *Tab.* 143. *Lin. Gen. Pl.* 617. Meadow Rue.

The Characters are,

The Flower has no Empalement, but has 4 or 5 roundish concave Petals which fall off soon, and a great Number of Stamina, broad and compressed toward their Tops, and terminated by Twin Summits which are oblong, with several very short Styles sitting singly upon roundish Germina and crowned by thick Stigmata. The Germina afterward turn to so many Keel-shaped Capsules collected in a Head, each containing 1 oblong Seed.

The Species are

1. THALICTRUM caule folioso sulcato, panicula erecta. *Hort. Cliff.* 226. Meadow Rue with a furrowed leafy Stalk, and many erect Panicles of Flowers. *Thalictrum majus, siliqua angulosa aut striata* C. B. P. 336. Greater Meadow Rue with angular or channelled Pods.

2. THALICTRUM caule anguloso, foliis linearibus bifidis trifidisque, panicula multiplici erecta. Meadow Rue with an angular Stalk, narrow Leaves ending in 2 or 3 Points, and many erect Panicles of Flowers. *Thalictrum majus, siliqua seminis striata, foliis rugosis trifidis.* *Mor. Umbel.* 70. Greater Meadow Rue with streaked Seed Vessels and rough trifid Leaves.

3. THALICTRUM fructibus pendulis triangularibus reftis, caule tereti. *Lin. Sp. Pl.* 547. Meadow Rue with a pendulous triangular Fruit, and a taper Stalk. *Thalictrum majus flaminibus florum purpurascens.* C. B. P. 337. Greater Meadow Rue with purple Stamina to the Flowers, commonly called feathered Columbine.

4. THALICTRUM caule folioso sulcato, foliis linearibus carnosiss. *Dalib. Paris.* 162. Meadow Rue with a furrowed leafy Stalk, and linear fleshy Leaves. *Thalictrum pratense minus alterum, Parisiensium, foliis crassioribus lucidis.*

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H. R. Par. Another smaller Meadow Rue of *Paris* with thicker shining Leaves.

5. *THALICTRUM floribus pentapetalis, radice fibrosa.* *Flor. Leyd. Prod.* 486. Meadow Rue with Flowers having 5 Petals and a fibrous Root. *Thalictrum Canadense.* *Cornut. Canad.* 186. Meadow Rue of *Canada*.

6. *THALICTRUM floribus pentapetalis, radice tuberosa* *Hort. Cliff.* 227. Meadow Rue with Flowers having 5 Petals, and a tuberous Root. *Thalictrum minus asphodeli radice, magno flore.* *Tourn. Inst.* 271. Smaller Meadow Rue with an Asphodel Root, and a large Flower.

7. *THALICTRUM foliis sexpartitis, floribus cernuis.* *Lin. Sp. Pl.* 546. Meadow Rue with Leaves cut into 6 Segments, and nodding Flowers. *Thalictrum minus. C. B. P.* 337. Smaller Meadow Rue.

8. *THALICTRUM caule paniculato ramosissimo foliofo.* *Lin. Sp. Pl.* 545. Meadow Rue with a very branching paniculated leafy Stalk. *Thalictrum minimum foetidissimum.* *C. B. P.* 337. The least stinking Meadow Rue.

9. *THALICTRUM floribus dioicis* *Lin. Sp. Pl.* 545. Meadow Rue with male and female Flowers. *Thalictrum pratense minus.* *Park. Theat.* 265. Small American Meadow Rue.

10. *THALICTRUM foliolis lanceolato-linearibus integerrimis* *Hort. Cliff.* 226. Meadow Rue with Spear-shaped linear Leaves which are entire. *Thalictrum pratense, angustissimo folio.* *C. B. P.* 337. The narrowest-leaved Meadow Rue.

11. *THALICTRUM caule simplicissimo subnudo, racemo simplici terminali.* *Hort. Cliff.* 227. Meadow Rue with a single Stalk which is almost naked, and terminated by a single Bunch of Flowers. *Thalictrum montanum minimum praecox, foliis splendentibus.* *Mor. Hist.* p. 325. The least Meadow Rue with shining Leaves.

The 1st Sort grows naturally by the Side of Rivers and in moist Meadows in many Parts of *England*. This has a yellow creeping Root, from which arise several furrowed Stalks, 5 or 6 Feet high, garnished at each Joint with Leaves composed of many Lobes which differ in their Form and Size; some are Spear-shaped and entire, others are obtuse, and cut into 3 Points; they are of a deep green Colour on their upper Side, but pale on their under. The Flowers are of an herbaceous white Colour, and formed into many Panicles, standing erect on the Top of the Stalks. These appear in *July*, and are succeeded by short triangular Capsules containing one oblong Seed.

The 2d Sort grows naturally in the Meadows about *Montpelier*. The Root of this is like the former; the Stalks are angular, and rise 5 Feet high; they are better furnished with Leaves, whose Lobes are very narrow, some of them ending with 2, and others with 3 Points, of a bright green Colour. The Flowers are yellow and are formed into many Panicles which terminate the Stalks. This Sort flowers about the same Time with the former.

The 3d Sort grows naturally on the *Alps*; of this there are two Varieties; one with a green Stalk and white Stamina, the other has purple Stalks and Stamina. These two are propagated in Gardens, by the Title of feathered Columbine; this hath a thick fibrous Root, the Stalks are taper and rise 3 Feet high; the Leaves are like those of the Columbine. The Flowers grow

in large Panicles at the Top of the Stalk. It flowers in *June*, and the Seeds, which are in triangular Capsules, ripen in *August*.

The 4th Sort grows naturally in the Meadows about *Paris*; this hath upright channelled Stalks which rise 3 Feet high, garnished at each Joint with winged Leaves composed of many linear fleshy Lobes, which are for the most part entire, ending in acute Points. The Flowers are of a yellowish white Colour; they appear in *July*, and are succeeded by small angular Capsules with one small oblong Seed in each, which ripens in *August*.

The 5th Sort grows naturally in *North America*; this has a fibrous Root of a dark Colour. The Stalks are smooth, of a purple Colour, and rise 3 or 4 Feet high, branching toward the Top. The Leaves are like those of Columbine, of a grayish Colour, and smooth. The Flowers are produced in large Panicles at the Top of the Stalks; they are larger than those of the former Sorts, and have 5 white Petals which soon fall off, and a great Number of white Stamina with yellow Summits. This flowers in *June*, and the Seeds ripen in *August*.

The 6th Sort grows naturally in *Spain*; this has knobbed Roots; the Leaves are small, obtuse, and indented in 3 Parts at their Points; they are of a grayish Colour and smooth. The Stalks rise a Foot and a Half high, naked almost to the Top, where the Stalk divides into 2 or 3 small ones, under which is situated 1 Leaf. Each Division of the Stalk is terminated by a small Bunch of pretty large Flowers having 5 white Petals. The Flowers are almost disposed in Form of an Umbel. They appear in *June*, and are succeeded by small angular Capsules containing 1 oblong Seed in each, which ripen in *August*.

The 7th Sort grows naturally in some Parts of *Cambridgehire*; this has a creeping fibrous Root. The Stalks rise about a Foot high, and are garnished with winged Leaves composed of many obtuse short Lobes, which are cut into 6 Segments. The Stalks branch out wide; the Flowers grow in loose Panicles; they are small and nodding. The Stamina are of an herbaceous white, and the Summits are yellowish. It flowers in *June*.

The 8th Sort grows naturally in the South of *France*; this hath a very branching Stalk which rises about 6 or 7 Inches high, garnished with winged Leaves which are downy, composed of a great Number of small Lobes which are bluntly indented, and have a foetid Scent. The Flowers grow in loose Panicles, they are small, of an herbaceous white Colour, with yellowish Stamina. This flowers in *June*.

The 9th Sort grows naturally in *North America*. The Root of this is fibrous; the Stalks rise near a Foot high, and are almost naked to the Top, where they have 1 Leaf, composed of many small Lobes of a grayish Colour, indented at their Points. The Flowers are produced in small Bunches at the Top of the Stalks; they are male and female in different Plants. These appear in *June*.

The 10th Sort grows naturally in *Italy* and some Parts of *Germany*; this hath a perennial Root. The Stalks rise from 2 to 3 Feet high; the Leaves are winged like those of the other Sorts; their Lobes are narrow and

and entire. The Flowers are small and are collected in Panicles at the Top of the Stalks, and are of an herbaceous white Colour.

The 11th Sort grows naturally on the Alps; this hath a fibrous creeping Root; the Leaves are small, blunt, and of a grayish Colour. The Stalks rise about 6 Inches high, and are almost naked; they are terminated by a loose single Spike of Flowers, each having 4 Petals. This flowers the latter End of April, or the Beginning of May.

These Plants are generally propagated by parting their Roots. The best Time for this Work is in September, when their Leaves begin to decay, that they may take fresh Root before the Frost comes on to prevent them; they should also be planted in a fresh light Soil, and have a shady Situation in which they will thrive exceedingly, though they may be planted in almost any Soil or Situation, provided it be not too hot and dry; but most of them creep so much under Ground, as to become very troublesome in a Garden, for which Reason, there are but few of the Sorts admitted into Gardens. The 3d, 5th, and 6th Sorts are frequently cultivated in the Gardens. The Roots of these do not creep like the others, and their Flowers have some Beauty to recommend them, but the others are only kept in Botanical Gardens for Variety; therefore when they are admitted, their Roots should be confined in Pots, otherwise they cannot be kept within Bounds.

THAPSIA. Tourn. Inst. R. H. 321. Tab. 171. Lin. Gen. Pl. 323. The deadly Carrot, or scorching Fennel.

The Characters are,

It has an umbellated Flower; the general Umbel is large and composed of about 20 Rays which are nearly equal, these have no Involucra; the general Umbel is uniform. The Flowers have 5 Spear-shaped incurved Petals, and 5 Hair-like Stamina the Length of the Petals, terminated by single Summits. It has an oblong Germen situated under the Flower, supporting 2 short Styles crowned by obtuse Stigmas. The Germen becomes an oblong Fruit, girt with a longitudinal Membrane dividing into 2 Parts, each containing 1 oblong Seed, pointed at both Ends, having plain Borders on both Sides.

The Species are,

1. THAPSIA foliolis dentatis basi coadunatis. Hort. Cliff. 105. Scorching Carrot with indented Lobes joined at their Base. *Thapsia latifolia villosa*. C. B. P. 148. Broad-leaved hairy scorching Fennel.

2. THAPSIA foliolis pinnatis, foliolis latissimis pinnatifidis subtus villosis petiolis decurrentibus. Scorching Carrot with winged Leaves having very broad Wing-pointed Lobes, hairy on their under Side, and running Foot Stalks. *Thapsia maxima, latissimo folio*. C. B. P. 148. The greatest scorching Fennel with a very broad Leaf.

3. THAPSIA foliolis multifidis basi angustatis. Hort. Cliff. 105. Scorching Carrot with many-pointed Lobes, narrowed at their Base. *Thapsia Carotæ folio*. J. B. 3. p. 187. Scorching Fennel with a Carrot Leaf.

4. THAPSIA foliolis multifidis setucis. Hort. Cliff. 106. Scorching Carrot with many-pointed bristly Lobes. *Thapsia tenuiore folio Apula*. Tourn. Inst. 322. Narrow-leaved scorching Fennel of Apulia.

5. THAPSIA foliolis ternatis ovatis. Lin. Sp. Pl. 262. Scorching Carrot with oval trifoliate Leaves. *Sium folio*

infimo cordato, caulinis ternatis, omnibus crenatis Flor. Virg. 31. Water Parsnep with Heart-shaped Leaves, those on the Stalks trifoliate, and all of them crenated.

6. THAPSIA foliolis multifidis acutis, subtus villosis, petiolis bispidis. Scorching Carrot with many-pointed acute Lobes, which are hairy on their under Side, and have hairy Foot Stalks. *Thapsia foliolis apii fetidissima, flore luteo*. Boerb. Ind. Alt. 1. 60. Scorching Fennel, with a stinking Parsley Leaf, and a yellow Flower.

The 1st Sort grows naturally in Spain, Portugal, and the South of France; this hath a thick fleshy Root in Shape of a Carrot, which has an outward blackish Skin, the Inside is white, bitter, and very acrid, with a little aromattick Taste. The Leaves are winged the Lobes are thick, hairy, and indented; they are regularly cut into opposite Segments like other winged Leaves. The Stalk is spongy, and rises about 2 Feet high, dividing upward into 2 or 3 small Branches, each being terminated by a large Umbel of yellow Flowers. These appear in June, and are succeeded by large, flat, bordered Seeds which ripen in August.

The 2d Sort grows naturally in Spain, and all over Old Castile, quite to the Pyrenean Mountains. The Root of this Sort is large, thick, and of a dark Colour without. The Leaves are very thick, and hairy on their under Side; they spread circularly on the Ground, and are divided into broad Lobes like most of the other umbelliferous Plants. The Stalks rise 3 or 4 Feet high; they are large, jointed, and full of Pith, having 1 Leaf at each Joint, shaped like those at the Bottom, but are smaller as they are nearer the Top. The Stalk is terminated by a large Umbel of yellow Flowers which appear the latter End of June and the Seeds ripen about two Months after.

The 3d Sort grows naturally in Italy and Spain. The Leaves of this Sort are cut into many narrow Segments, almost as small as those of the Garden Carrot, but are rough and hairy, their Segments are always opposite, and are narrower at their Base than their Points. The Stalks rise about 2 Feet high, and are terminated by Umbels of small yellow Flowers which appear in July; these are succeeded by flat bordered Seeds which ripen the Beginning of September.

The 4th Sort grows naturally in Apulia. The Root of this is about the Thickness of a Man's Thumb; the Bark is yellow and wrinkled, the Inside white, and abounds with an acrid milky Juice; the Leaves are finely divided like those of Fennel, they are hairy, and sit close to the Root. The Stalk rises from 2 to 3 Feet high; it is naked and branches into 2 or 3 Stalks, each being terminated by a small Umbel of Flowers, which are large, yellow, and appear in July; these are succeeded by flat Seeds, having cartilaginous Borders which ripen in September.

The 5th Sort grows naturally in North America. The Seeds were sent me by Dr. Benfel from Philadelphia. This has a slender Tap Root, shaped like that of Parsley; the Leaves of the Bottom are Heart-shaped. The Stalk is single and does not branch; it rises near 2 Feet high, is of a purple Colour, and slender; this is garnished at each Joint with one trifoliate Leaf, whose Lobes are oval and crenated. The Stalk is terminated by a small Umbel of purple Flowers, which appear in July,

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July, and are succeeded by compressed channelled Seeds which ripen in September. Dr. Gronovius thinks this Plant very like that which is figured by *Kempfer* by the Title of *Nindzi*.

The 6th Sort grows naturally in *Austria*; this has a taper Root as large as a Man's Thumb. The Leaves spread circularly on the Ground; these are divided into several Parts; the Lobes are very small, and cut into many acute Segments or Points, which are opposite like winged Leaves; they are rough and hairy. The Foot Stalks of the Leaves are broad and closely set with prickly Hairs; the Stalk rises near 2 Feet high, and is terminated by an Umbel of yellow Flowers, which appear in July, and are succeeded by bordered compressed Seeds which ripen in September.

These Plants are only propagated by Seeds, which should be sown in Autumn; for if they are kept out of the Ground till Spring, they often miscarry, or if they grow, they commonly lie a whole Year in the Ground before the Plants come up; whereas those Seeds which are sown in Autumn, generally grow the following Spring. These should be sown in Drills, in the Place where they are designed to remain. The Drills should be at least two Feet and a Half asunder, because the Plants spread their Leaves very wide. When the Plants come up in the Spring, they must be carefully cleared from Weeds; and where they are too close together, some of them should be drawn out, to give Room for the others to grow, but at this Time they need not be left more than 2 or 3 Inches apart; for the first Year the Plants arise from Seeds, they make but slow Progress, so the Autumn following the remaining Part of the Plants may be taken up, leaving those which are designed to remain, about 18 Inches asunder; and those Plants which are taken up, may be transplanted into another Bed, if they are wanted. After the first Year these Plants will require no farther Care, but to keep them clear from Weeds; and every Spring just before the Plants begin to push out new Leaves, the Ground should be carefully dug between the Plants, to loosen it, but the Roots must not be injured, lest it should cause them to decay. The Plants being thus managed, will continue several Years, and produce Flowers and Seeds annually, from which new Plants may be raised. They delight in a soft loamy Soil, and if they are exposed only to the Morning Sun, they will thrive better than if they have a warmer Situation, for they endure the Cold of our Winters very well.

The Roots of the 3d Sort were formerly used in Medicine, but are now never ordered, being supposed to have a poisonous Quality. *Boerhaave* says it has much the same Qualities as *Euphorbium*, it burns the Bowels and produces a Diarrhæa.

THELIGONUM. *Lin. Gen. Pl. 947. Cynocrambe. Tourn. Cor. 52. Tab. 485. Dogs Cabbage.*

The Characters are, It has male and female Flowers on the same Plant. The male Flowers have a turbinated Empalement of 1 Leaf, cut into 2 Segments which turn backward. It has no Petal but several erect Stamina the Length of the Empalement, terminated by single Summits. The female Flowers have a small bifid Empalement of 1 Leaf which is permanent. It has no Petals, but has a globular Germen, supporting a short

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Style crowned by an obtuse Stigma. The Germen afterward becomes a thick globular Capsule with 1 Cell, inclosing 1 globular Seed.

We have but one Species of this Genus, viz.

THELIGONUM. *Sawo. Monsp. 129. This is the Cynocrambe Dioscoridis C. B. P. 122. Dogs Cabbage of Dioscorides.*

This Plant grows naturally in the South of France, in Italy, and Tartary. It is an annual Plant, which decays as soon as the Seeds are ripe. The Stalks trail on the Ground like those of Chickweed; they grow about a Foot long; their Joints are pretty close; these are garnished with oval acute-pointed Leaves, standing on pretty long Foot Stalks, which are bordered. At each Joint is placed one of these Leaves, and from the same Point come out several smaller Leaves of the same Shape on shorter Foot Stalks. The Flowers are produced from the Wings of the Stalk in Clusters sitting very close; they are small, of an herbaceous white Colour, so make no great Appearance. The male and female Flowers grow from the same Joint. The female Flowers are succeeded by a single roundish Seed, which ripens in Autumn.

It is preserved in Botanick Gardens for Variety. The Seeds of this must be sown in Autumn, in the Place where the Plants are to remain; for when they are sown in the Spring, the Plants rarely come up the same Year. They require no other Culture but to keep them clean from Weeds, and thin them where they are too close.

THEOBROMA. *Lin. Gen. Pl. 806. Guazuma. Plum. Nov. Gen. 36. Tab. 18; Ballard Cedar.*

The Characters are,

The Empalement of the Flower is composed of 3 oval, concave Leaves reflexed. The Flower has 5 oval Petals which spread open, and are hollowed like a Spoon; from the Top of each Petal comes out a bifid bristly Ligula, divided like 2 Horns. It has a great Number of short Stamina joined in 5 Bodies, and the Length of the Petals which are terminated by roundish Summits, and a roundish Germen supporting a single Style the Length of the Petals crowned by a single Stigma. The Germen afterward turns to a roundish Fruit with 5 Angles, opening in 5 Cells, each containing several Seeds.

We have but one Species of this Genus, viz.

THEOBROMA *foliis serratis. Hort. Cliff. 379. Theobroma with sawed Leaves. Guazuma arbor ulmifolia, fructu ex purpura nigro. Plum. Nov. Gen. 36. Tree Guazuma with an Elm Leaf and a black purple Fruit.*

This grows naturally in most of the Islands in the West-Indies, where it rises to the Height of 40 or 50 Feet, having a Trunk as large as a middle-sized Man's Body, covered with a dark brown furrowed Bark sending out many Branches toward the Top, which spread out wide on every Hand, and are garnished with oblong Heart-shaped Leaves placed alternate, which are near 4 Inches long, and 2 broad near their Base, ending in acute Points, of a bright green on their upper Side, and pale on their under, sawed on their Edges, with a strong Mid-rib, and several transverse Veins, and stand on short Foot Stalks. The Flowers come out in Bunches from the Wings of the Leaves; they are small and of a yellow Colour, having 5 concave Petals which

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spread open circularly, and a great Number of Stamina which at their Base are joined in 3 Bodies, terminated by roundish Summits. In the Center is situated a roundish Germen, supporting a slender Style the Length of the Stamina, crowned by a single Stigma. The Germen afterward turns to a roundish warted Fruit having 5 obtuse Angles, and 5 Cells which contain several irregular Seeds.

The Wood of this Tree is white and ductile, so is frequently cut into Staves for Casks. The Fruit and Leaves are good Fodder for Cattle, therefore when the Planters clear the Land from Wood, they leave the Trees of this Sort standing for the Feed, which is of great Use in dry Seasons, when the common Fodder is scarce.

There are some Plants of this Sort preserved in the Gardens of some curious Persons; it is propagated by Seeds, which must be procured as fresh as possible, from the Countries where the Plants grow naturally. These should be sown on a good hot Bed in the Spring, and when the Plants are fit to remove, they should be each planted in a separate small Pot, and plunged into a hot Bed of Tanners Bark, observing to shade them from the Sun till they have taken new Root, then they should be treated as the Coffee Tree, keeping them always in the Tan Bed in the Stove.

THLASPI Tournef. Inst. R. H. 212. Tab. 101. Lin. Gen. Plant. 719. Mithridate, or Treacle Mustard.

The Characters are,

The Empalement of the Flower is composed of 4 oval concave Petals which fall off. The Flower has 4 oval Petals, double the Size of the Empalement, placed in Form of a Cross; it has 6 Stamina half the Length of the Petals, 2 of which are shorter than the others, terminated by acute Summits, and a roundish compressed Germen, supporting a single Style, the Length of the Stamina, crowned by an obtuse Stigma. The Germen afterward becomes an oval, Heart-shaped compressed little Pod, with an acute Border divided into 2 Cells by an intermediate Partition, containing 2 or 3 Seeds in each.

The Species are,

1. THLASPI siliculis subrotundis, foliis sagittatis dentatis incanis. Hort. Cliff. 330. Treacle Mustard with roundish Pods, and Arrow-pointed, hairy, and indented Leaves. Thlaspi arvense, vaccariae, incano folio majus. C. B. P. 106. Mithridate Mustard, or Bastard Cress.

2. THLASPI siliculis orbiculatis, foliis oblongis dentatis glabris. Flor. Lapp. 251. Treacle Mustard with orbicular Pods, and oblong, indented, smooth Leaves. Thlaspi arvense siliculis latior. C. B. P. 105. Treacle Mustard, or Penny Cress.

3. THLASPI siliculis subrotundis, foliis oblongo-cordatis amplexicaulibus integerrimis. Treacle Mustard with roundish Pods, and oblong, Heart-shaped, entire Leaves which embrace the Stalks. Thlaspi arvense, perfoliatum majus. C. B. P. 106. The greater, wild, perfoliate Treacle Mustard.

4. THLASPI siliculis subrotundis, foliis lanceolatis integerrimis Hort. Cliff. 330. Treacle Mustard with Leaves almost orbicular, and Spear-shaped entire Pods. Thlaspi capsula cordata, peregrinum. J. B. 2. 927. Foreign Treacle Mustard with a Heart-shaped Pod.

5. THLASPI siliculis subrotundis ventricosis, foliis oblongis

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gis obtusis dentatis glabris. Prod. Leyd. 334. Treacle Mustard with almost oval swelling Pods, and oblong, blunt, smooth, indented Leaves. Thlaspi Allium redolens. Mor. Hist. 2. p. 297. Treacle Mustard with the Smell of Garlic.

6. THLASPI siliculis subrotundis pilosis, foliis caulinis sagittatis hirsutis. Prod. Leyd. 333. Treacle Mustard with roundish hairy Pods, and hairy Arrow pointed Leaves on the Stalks. Thlaspi villosum capsulis hirsutis C. B. P. 106. Perennial Mithridate Mustard.

7. THLASPI siliculis obcordatis, foliis radicalibus cuneiformibus integerrimis. Lin. Sp. Pl. 647. Treacle Mustard with Heart-shaped Pods, and the lower Leaves Wedge-shaped and entire. Thlaspi foliis globularia. J. B. 2. p. 926. Treacle Mustard with a blue Daisy Leaf.

8. THLASPI siliculis ellipticis, foliis lanceolato-linearibus integerrimis. Sauv. Monsp. 53. Treacle Mustard with elliptical Pods, and linear, Spear-shaped entire Leaves. Thlaspi parvum saxatile, flore rubente. C. B. P. 107. Small rocky Treacle Mustard with a reddish Flower.

The 1st Sort grows naturally among the Corn in divers Parts of England, as also on the Side of dry Banks; it is a biennial Plant, which perishes soon after it has ripened its Seeds. The Root is composed of ligneous Fibres which spread in the Ground; the Leaves are near 3 Inches long, narrow at their Base, and broader toward their Points, where they have several Indentures; they are hoary on both Sides. The Stalk rises about a Foot high, branching out toward the Top, and is pretty closely garnished with Leaves, placed alternately, sitting close to the Stalks, whose Ears embrace the Stalk. The Flowers are produced in short Spikes at the End of the Stalks; they are small, white, and composed of 4 Petals placed in Form of a Cross; these appear in June, and are succeeded by roundish Capsules having 2 Cells, containing 2 or 3 Seeds in each, which ripen in August. The whole Plant has a warm biting Taste. The Seeds of this are frequently used instead of those of the next, which is the Sort directed to enter the Composition of Venice Treacle.

The 2d Sort is an annual Plant which grows naturally in several Parts of England: I have found it growing in Plenty in the Meadows on the right Hand Side of Godalming. The Root of this is composed of slender Fibres; the Stalk rises a Foot high, is angular, channelled, and smooth; the Leaves are about 2 Inches long, are smooth and indented, of a deep green Colour, and sit close to the Stalks; the Flowers are produced in loose Spikes toward the upper Part of the Stalks, are small, white, and composed of 4 Petals placed crosswise like the former; these are succeeded by broad, flat, roundish compressed Pods, having leafy Borders, which have 2 Cells, each containing 2 or 3 dark brown Seeds tasting like Garlic. It flowers in June, and the Seeds, which are an Ingredient in Theriaca, ripen in August.

The 3d Sort is an annual Plant, which grows naturally in the northern Counties of England: Of this there are two Sorts mentioned in Books, which differ only in Size, so that I believe it is owing to the different Soils in which they grow, for I have frequently sown the Seeds of both in the Garden, where, when the Plants came

up, they have proved to be the same. The Stalks of this rise about 2 Inches high, and are divided at the Top into several Branches, which are clothed with oblong Heart-shaped Leaves, whose Bases embrace the Stalks; they are smooth and entire. The Flowers are small, white, and are produced in loose short Spikes at the End of the Branches; they appear the Beginning of June, and the Seeds ripen early in August.

The 4th Sort grows naturally in Sicily; this is a biennial Plant, whose Stalks rise 8 or 9 Inches high, branching out toward the Top, and are garnished with blunt thick Leaves, of a grayish Colour which are Spear-shaped and entire; they are placed opposite sitting close to the Stalk; they have a bitter warm Taste. The Flowers are produced in loose Spikes at the Top of the Stalks; they are small, and of a purple Colour, having 4 Heart-shaped Petals placed in Form of a Cross; these are succeeded by Heart-shaped Pods of a fine green Colour, divided into 2 Cells, each containing 3 or 4 small oblong yellowish Seeds, which have an acrid Taste. It flowers in June, and the Seeds ripen in August.

The 5th Sort is an annual Plant which grows naturally in the northern Parts of Europe; this rises about 6 or 8 Inches high. The Stalk branches toward the Top, and is garnished with oblong smooth blunt Leaves a little indented; these sit close to the Stalk, and, if bruised, have a strong Scent of Garlick. The Branches are terminated by loose Spikes of small white Flowers, composed of 4 roundish Petals, placed in Form of a Cross; these appear in June, and are succeeded by swelling roundish Pods, containing a few dark brown Seeds which ripen in July.

The 6th Sort grows naturally in Wales, and in a few Places in England; this has a perennial creeping Root. The lower Leaves are oblong and hoary; they are very slightly sinuated, but not indented on the Edges. The Stalks are about 5 or 6 Inches long, and are bent toward the Ground; the Flowers are rather larger than those of the first Sort, but are of the same Form; the Pods are hoary, but not hairy. It flowers in May, and the Seeds ripen in July. This grows naturally on the Side of a Bank beyond Wandsworth in the Road to Putney.

The 7th Sort grows naturally on the Alps, and in some Parts of Yorkshire in dry stony Pastures. The Root of this is perennial and creeping; the Stalks rise 4 or 5 Inches high; the lower Leaves are Wedge-shaped, being broad and rounded at their Points, but narrow at their Base, of a deep green Colour, and entire; those upon the Stalks are rounder, and sit very close. The Flowers are produced in loose Spikes at the End of the Branches; they are small and white, shaped like those of the other Sorts, and appear in May; these are succeeded by roundish Heart-shaped Pods, divided into 2 Cells, each containing 2 or 3 brown Seeds which ripen in July.

The 8th Sort grows naturally in rocky Places, in the South of France, in Spain, and Italy; it is a biennial Plant with us. The Root is composed of ligneous tough Fibres, which penetrate the Crevices of the Rocks; the lower Leaves are roundish, fleshy and entire; the Stalks rise about 5 Inches high, and divide into small Branches,

garnished with linear Spear-shaped entire Leaves about three Quarters of an Inch long; they are fleshy, and of a deep green Colour, having smooth Surfaces. The Flowers grow in loose Spikes at the End of the Branches; they are of a beautiful red Colour with some dark bloody Stripes; these are succeeded by oblong elliptical Pods which contain several small red Seeds. It flowers in June, and the Seeds ripen in August.

These Plants are propagated by Seeds, which should be sown where the Plants are to remain, which may be performed either in the Spring or Autumn, but the latter is to be preferred, because the Seeds at that Season never fail, and the Plants, which come up before Winter, will grow much stronger, and produce a greater Quantity of Seeds than those sown in the Spring especially if the Season proves dry, and there is very little Danger of the Plants being injured by Frost in Winter, if they are upon dry Ground. When the Plants come up, they will require no other Care, but to thin them where they are too close, and keep them clean from Weeds.

These 2 Sorts, which are first mentioned, may be cultivated for their Seeds to be used in Medicine, so may be sown thin upon Beds of light Ground, as other Garden Plants, and when they come up, the Ground should be hoed to destroy the Weeds, and where they are too thick, they should be cut up in the same Manner as is practised for Onions, Carrots, &c. leaving them 3 or 4 Inches apart, and by twice hoeing the Ground, if it is well performed, and in dry Weather, it will keep the Ground clean till the Seeds are ripe.

The other Sorts are seldom cultivated but in Botanical Gardens for Variety, so a few Plants of each will be sufficient; therefore these may be sown in Drills, and when the Plants come up, they must be thinned, and kept clean from Weeds. If the Seeds of these Plants are permitted to scatter, the Plants will come up without Care.

THISTLE. See *Carduus*.

THORN APPLE. See *Datura*.

THORN. the *Glastenbury*. See *Mespilus*.

THURIFEROUS signifies bearing or producing Frankincense.

THUYA. *Tourn. Inst. R. H.* 586. *Tab.* 358. *Lin. Gen. Pl.* 957. The *Arbor Vitæ*, vulgò; in French, *Arbre de Vie*.

The Characters are,

It has male and female Flowers in the same Plant; the male Flowers produced in an oval Katkin. The Flowers are placed opposite upon the common Foot Stalk, each Flower embracing it with its Base; these come out of an oval concave Scale; they have no Petals, but 4 Stamina scarce discernible; their Summits adhere to the Base of the Scale of the Empalement. The female Flowers are collected in a common almost oval Cone, 2 Flowers standing opposite in each Scale; they have no Petals, but a small Germen, supporting a slender Style, crowned by a single Stigma; these are succeeded by an oblong oval Cone, opening longitudinally, whose Scales are almost equal, convex on the Outside, and obtuse, each containing an oblong Seed, with a membranaceous Wing.

The Species are,

1. THUYA *strobilis levidus*, squamis obtusis. *Hort. Cliff.*

440. *Thuja* with smooth Cones, and obtuse Scales. *Thuja Theophrasti*. C. B. P. 488. The common Arbor Vitæ.

2. *THUYA strobilis squarrosis, squamis acuminatis reflexis*. Hort. Upsal. 289. *Thuja* with rugged Cones, and acute-pointed reflexed Scales. *Thuja strobilis uncinatis, squamis reflexo-acuminatis*. Flor. Leyd. Prod. 87. The China Arbor Vitæ.

The 1st Sort grows naturally in *Canada*, *Siberia*, and other northern Countries, but has been long an Inhabitant in the *English* Gardens. In some of these Gardens, which have not been altered, there are some of these Trees of a large Size: It has a strong woody Trunk which rises to the Height of 40 Feet or more. The Bark, while young, is smooth, and of a dark brown Colour, but, as the Trees advance, the Bark becomes cracked and less smooth. The Branches are produced irregularly on every Side, standing almost horizontal, and the young slender Shoots frequently hang downward; these Branches stand but thin, and the younger Branches only are garnished with Leaves, so that when the Trees are grown large, they make but an indifferent Appearance, being so thinly clothed with Leaves. The young Branches are flat, and the small Leaves lie *imbricatum* over each other like the Scales of Fish; the Flowers are produced from the Side of the young Branches, pretty near to the Foot Stalk, the male Flowers grow in oblong Katkins, and between these the female Flowers are collected in Form of Cones. When the former have shed their Farina, they soon after drop off, but the female Flowers are succeeded by oblong Cones, having obtuse smooth Scales, containing one or two oblong Seeds. It flowers early in Spring, and the Seeds ripen in *September*. The Leaves of this Tree have a rank oily Scent when bruised.

The 2d Sort grows naturally in the northern Parts of *China*, where it rises to a considerable Height, but this has not been long enough in *Europe* to have any Trees of large Size here. The Seeds of this Sort were first sent to *Paris* by some of the Missionaries, and there are some of the Trees growing in the Gardens of some curious Persons there, which are more than twenty Feet high. The Branches of this Sort grow closer together, and are much better adorned with Leaves, which are of a brighter green Colour, so make a much better Appearance than the other, and, being very hardy, is esteemed preferable to most of the ever-green Trees with small Leaves, for Ornament in Gardens. The Branches of this Tree cross each other at right Angles; the Leaves are flat, but the single Divisions of the Leaves are slender, and the Scales are smaller, and lie closer over each other than those of the first Sort. The Cones are also much larger, and of a beautiful gray Colour; their Scales end in acute reflexed Points.

These Trees may be propagated by Seeds, Layers, or Cuttings. The 1st Sort is commonly propagated by Cuttings; these should be planted in *September*, on a shady Border, and in a loamy Soil; the Cuttings should be chosen from the Shoots of the same Year, with a small Joint of the former Year's Wood at the Bottom of each. These should be planted 3 or 4 Inches deep, in Proportion to their Length, treading the Ground close to them to prevent the Admission of Air. If the following Spring should prove dry, there should be a little Mulch laid over the Surface of the Ground to prevent

its drying; where this is performed in Time, it will save the Trouble of watering the Cuttings, and it will be much better for them, because when these are are putting out their young Fibres, if they are much watered, it will rot them while they are tender. These Cuttings will be rooted enough to transplant by the next Autumn, when they may be either planted in Beds or in Nursery Rows to be trained up.

When they are propagated by Layers, the young Branches only should be laid down in Autumn, which will also put out Roots by the next Autumn, when they may be taken up, and transplanted in the same Manner as those raised from Cuttings, but although these are very expeditious Methods of propagating this Tree, yet those who are desirous to have large Trees, should always propagate them by Seeds, for the Plants so raised will be much preferable to the other.

There is a Variety of the first Sort with variegated Leaves, which some People keep in their Gardens for Variety; but as this proceeds from a Weakness in the Plants, whenever they become strong and vigorous, they always return to their plain Colour, to prevent which, they generally plant them in very poor Ground. This Variety can only be preserved by propagating the Plants either by Cuttings or Layers.

The *China* Sort is generally propagated by Layers as the former, but the Cuttings of this, if rightly managed, will take Root very freely, but most People have overnursed them. If these are planted in *September* in a Border of soft Loam, exposed to the East, and before the hard Frost sets in, the Surface of the Ground covered with old Tanner's Bark about 2 Inches thick, it will prevent the Frost from penetrating the Ground very deep, and if this remains in the Spring, it will also keep the Ground moist, for if these Cuttings, or Layers of this Sort are watered in the Spring, when they are beginning to put out young Fibres it will certainly rot them, as I have frequently experienced; therefore I advise every one not to wather these Cuttings or Layers, nor should the Plants be much watered when transplanted, for the same Reason; but as there are many Plants now in *England* which ripen their Seeds, those who can be supplied with them, should prefer this to both the other Methods of propagating the Plants; for, after the first two Years, the seedling Plants will greatly outstrip the other in Growth, and the Plants will be much handsomer.

These Seeds should be sown soon after they are ripe, which is in the Spring. These should be sown in Pots filled with soft loamy Earth, and plunged into the Ground in an East Border, where they may have only the Morning Sun, observing always to keep the Pots clean from Weeds. Sometimes these Seeds will come up the same Year, but they often lie in the Ground till the next Spring; therefore the Pots should be put in a common hot Bed Frame in Winter, and in the Spring the Plants will come up; these must not be too much exposed to the Sun the first Year, and if in the next Winter they are sheltered under a Frame, it will be a good Way to preserve them, and the Spring following they may be transplanted into Beds, and treated as those propagated by Cuttings.

THYMBRA. *Lin. Gen. Pl.* 627.

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The Characters are,

It has an Empalement of 1 Leaf whose Brim is cut into 2 Lips; the upper Lip is broad, and has 3 equal Points; the under is narrow and cut into 2 Parts. The Flower is of 1 Petal, of the Lip Kind. The upper Lip is concave, and cut into 2 obtuse Segments. The lower Lip ends with 3 almost equal Points; it has 4 slender Stamina, the 2 under being shorter than the other, terminated by Twin Summits under the upper Lip, and a four-pointed Germen supporting a slender half bifid Style crowned by acute Stigmas. The Germen afterward becomes 4 Seeds which ripen in the Empalement.

The Species are,

1. *THYMBRA floribus spicatis*. Lin. Sp. Pl. 569. *Thymbra* with Spiked Flowers. *Hyssopum montanum*, *Macedonicum*, *valerandi dourez*. I. B. 3. 2. 276. Mountain Macedonian Hyssop.

2. *THYMBRA floribus verticillatis*. Lin. Sp. Pl. 569. *Thymbra* with whorled Flowers. *Hyssopus angustifolia*, *montana*, *aspera*. C. B. P. 218. Rough narrow-leaved Mountain Hyssop.

The 1st Sort grows naturally on Mount Libanus, in Macedonia, and Spain; it is a low shrubby Plant like Heath, branching out into slender ligneous Stalks, 6 or 8 Inches long, covered with a brown Bark, and garnished with narrow acute-pointed Leaves about half an Inch long, sitting close to the Stalks opposite; they have an aromack Odour when bruised. The Stalks are terminated by thick close Spikes of purple Flowers near 2 Inches long. The Empalements are stiff and hairy, they are cut half their Length into acute Segments; out of these the Flowers peep, with their two Lips, the upper is concave and arched, the under is cut into 3 equal Portions, and these are a little reflexed. These appear in June and July, and in warm Seasons they are sometimes succeeded by Seeds which ripen in Autumn.

The 2d Sort grows naturally in Spain and Italy; this has a shrubby Stalk which seldom rises much more than a Foot high, putting out many small ligneous Branches garnished with narrow Spear-shaped Leaves which have many Punctures; they stand opposite, and are of an aromack Flavour. The Flowers grow in whorled Spikes at the End of the Branches. The Leaves which stand under each Whorl, are broader than those below, and are covered with fine Hairs. The Flowers are purple; and sit close to the Stalks; the upper Lip is concave and ends with 2 obtuse Points; the lower Ends with 3 equal Points. These appear about the same Time with the other, and in warm Seasons the Seeds ripen in England.

These Plants are propagated by Seeds which should be sown in the Spring on a Bed of light Earth, where, if the Seeds are good, the Plants will appear in about 6 or 8 Weeks. When they come up they must be kept clean from Weeds, and in July they will be fit to remove, at which Time part of them should be planted in small Pots, and the other may be planted in a warm Border of dry Ground, being careful to shade them from the Sun and supply them with Water till they have taken new Root; after which those in the full Ground will require no other Care but to keep them clean from Weeds; and, if the Winter should prove very severe, they should be covered with Mats or some other Cover-

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ing to protect them; for the young Plants are in greater Danger of being destroyed than those which are older. Those Plants in the Pots should be sheltered under a common Frame in Winter, where they may enjoy the free Air in mild Weather, and be protected from hard Frost.

These Plants will live in the open Air in England unless the Winters prove very severe, especially if they are planted in a poor, dry, stony Soil.

THYMELEA. See *Daphne* and *Passerina*.

THYMUS. Tourn. Inst. R. H. 196. Tab. 93. Lin. Gen. Pl. 646. Thyme.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf, divided into 2 Lips, whose Chaps are hairy and shut. The upper Lip is broad, plain, erect, and indented in 3 Parts; the under Lip ends in 2 equal Bristles. The Flower is of the Lip Kind, it has 1 Petal with a Tube the Length of the Empalement. The Chaps are small, the upper Lip is short, erect, obtuse, and indented at the Point; the lower Lip is long, broad, and divided into 3 Parts, the middle Segment being broadest. It has 4 incurved Stamina, 2 being longer than the other, terminated by small Stamina, and a four-pointed Germen supporting a slender Style, crowned by a bifid acute Stigma. The Germen afterward turns to four small roundish Seeds, ripening in the Empalement, whose Neck is narrowed.

The Species are,

1. *THYMUS erectus, foliis revolutis ovatis, floribus verticillato-spicatis*. Hort. Cliff. 305. Upright Thyme with oval Leaves which turn backward, and Flowers growing in whorled Spikes. *Thymus vulgaris, folio latiore*. C. B. P. 219. Common broad-leaved Thyme.

2. *THYMUS foliis lineari-lanceolatis incanis, floribus verticillato-spicatis*. Thyme with linear, Spear-shaped, hoary Leaves, and Flowers growing in whorled Spikes. *Thymus vulgaris, folio tenuiore*. C. B. P. 219. Common Thyme with narrow Leaves.

3. *THYMUS capitulis imbricatis magnis, bracteis ovatis, foliis lanceolatis*. Lin. Sp. Pl. 592. Thyme with large imbricated Heads, oval Bractes, and Spear-shaped Leaves. *Thymus Lusitanicus cephalotes, squamis capitulorum amplioribus*. Tourn. Inst. 196. Portugal Thyme with large Heads, having very large Scales.

4. *THYMUS capitulis imbricatis magnis, bracteis dentatis, foliis setaceis pilosis*. Lin. Sp. Pl. 592. Thyme with large imbricated Heads, indented Bractes, and bristly hairy Leaves. *Thymus Lusitanicus, folio capillaceo villoso, capite magno purpurascens oblongo*. Tourn. Inst. 196. Portugal Thyme with a hairy narrow Leaf, and a large oblong purplish Head.

5. *THYMUS floribus capitatis, caulibus repentibus, foliis ovatis pilosis*. Thyme with Flowers growing in Heads, creeping Stalks and oval hairy Leaves. *Serpyllum latifolium hirsutum*. C. P. P. 220. Broad-leaved hairy Mother of Thyme.

6. *THYMUS floribus capitatis, caulibus repentibus, foliis lanceolatis glabris*. Thyme with Flowers growing in Heads, creeping Stalks, and smooth Spear-shaped Leaves. *Serpyllum vulgare majus, flore purpureo*. C. B. P. 220. Common greater Mother of Thyme, with a purple Flower.

7. *THYMUS caulibus repentibus, foliis ovatis glabris, floribus verticillato-spicatis*. Thyme with strong creeping Stalk

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Stalks, oval smooth Leaves, and Flowers growing in whorled Spikes. *Serpyllum vulgare majus flore minore.* Bot. Par. 183. Common greater Mother of Thyme with a smaller Flower.

8. *THYMUS caulibus repentibus, foliis ovato lanceolatis rigidis lanuginosis, floribus capitatis.* Thyme with creeping Stalks, oval, Spear-shaped, stiff Leaves, which are downy, and Flowers growing in Heads. *Serpyllum saxatile bifutum, Thymi folium nanum, flore purpureo.* Bot. Par. 183. Hairy Rock Mother of Thyme, having a Dwarf Thyme Leaf, and a purple Flower.

9. *THYMUS caulibus decumbentibus foliis lineari-lanceolatis glabris, floribus alaribus terminalibusque.* Thyme with trailing Stalks, linear, Spear-shaped, smooth Leaves, and Flowers growing at the Wings and Tops of the Stalks. *Serpyllum odoratissimum glabrum, longiore angustioreque folio.* Amman. Smooth, sweet-scented, Mother of Thyme with a longer and narrower Leaf.

The first Sort is the common Thyme, cultivated in the Gardens for the Kitchen, and also for Medicine. This grows naturally on stony rocky Places in the South of France, in Spain and Italy, and is so well known here as to need no Description.

This Plant may be propagated either by Seeds, or parting the Roots; the Season for either is in March or October. If it is propagated by Seeds, they should be sown on a Bed of light Earth, observing not to bury the Seeds too deep, which will cause them to rot, nor to sow them too thick, for the Seeds are very small. When the Plants are come up, they should be carefully cleared from Weeds; and if the Spring should prove dry, and they are watered twice a Week, it will greatly promote their Growth. In June the Plants should be thinned, leaving them about 6 Inches asunder each Way, that they may have Room to spread; and those Plants which are drawn out may be transplanted into fresh Beds at the same Distance; observing to water them until they have taken Root, after which they will require no farther Care, but to keep them clear from Weeds; and the Winter following they may be drawn up for Use.

But if the Plants are propagated by parting their Roots, the old Plants should be taken up at the Times before-mentioned, and split into as many Parts as can be taken off the Root; these should be transplanted into Beds of light fresh Earth, at 6 or 8 Inches Distance; observing if the Season is dry to water them until they have taken Root, after which they must be duly weeded, and they will thrive, and soon be fit for Use.

In order to save the Seeds of these Plants, some of the old Roots should remain unremoved in the Place where they were sown the preceding Year; these will flower in June, and in July the Seed will ripen, which must be taken as soon as it is ripe, and beat out, otherwise the first Rain will wash it all out of the Husks.

These Plants root greatly in the Ground, and thereby draw out the Goodness of the Soil sooner than most other Plants; so that whatever is sown or planted upon a Spot of Ground, whereon Thyme grew the preceding Year, will seldom thrive, unless the Ground be trenched deeper than the Thyme rooted, and well dunged.

If this Plant grows upon Walls, or on dry, poor stony Land, it will endure the greatest Cold of this

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Country; but in rich Ground where the Plants grow vigorously, they are sometimes destroyed by severe Frost.

There is a Variety of this with variegated Leaves, which is by some preserved in their Gardens.

The 2d Sort has shorter Stalks, the Leaves are longer, narrower, and end in sharper Points than the first, and the whole Plant is hoary. The Flowers grow in long whorled Spikes, and are larger than those of the common Thyme. This may be propagated and treated as the first Sort.

The 3d Sort grows naturally in Spain and Portugal; this has a low woody Stalk, from which come out many stiff Branches about 5 or 6 Inches long, garnished with small, narrow, Spear-shaped Leaves placed opposite, and terminated by pretty large Heads of Flowers, which come out from oval scaly Leaves lying over each other like the Scales of Fish; they are white, and but small, so make no great Appearance. The whole Plant is of a hoary Colour, and has an aromatick weak Scent. It flowers in July, but unless the Season proves warm the Seeds do not ripen in England.

The 4th Sort grows naturally in Portugal; this has slender, ligneous, hairy Stalks, which grow erect, about 6 Inches high, garnished with very narrow, bristly, hairy Leaves, which at the lower Part of the Stalks, come out in Clusters; but upward they are placed by Pairs. The Stalks are terminated by large scaly Heads. The leafy Scales are indented in acute Points; these lie over each other in the same Order as the other, and between them the Flowers peep out, which are of a purple Colour, and shaped like those of the common Thyme. This Plant flowers in July, but does not produce Seeds in England.

These two Sorts may be propagated by Slips, if they are planted in April on an East Border and closely covered with a Bell or Hand Glas, refreshing them once or twice a Week with Water, which must not be given to them in too great a Quantity. When these have put out good Roots, some of them may be transplanted into Pots, to be sheltered under a Frame in Winter; the others should be planted on a warm Border of dry Ground, observing to shade and water them till they have taken new Root. These Plants will live through the Winter in the open Air, in a warm dry Situation, but in severe Frost they are generally destroyed; they may be propagated by Seeds, when they can be procured. If these are sown on a Bed of light Earth the same Way as common Marjoram, the Plants will come up, and may be treated as those raised from Slips.

The 5th Sort is the common Mother of Thyme, which is frequently titled wild Thyme; it grows naturally on dry Commons and Pastures in most Parts of England, so is very rarely admitted into Gardens. This is so well known as to need no Description. There is a very common Mistake which has prevailed in Regard to this Plant; which is, that the Sheep and Deer which feed upon them, have much finer flavoured Flesh than others, whereas no Cattle will meddle with it; for in the Places where it grows, when the Grass is as closely eaten down as possible, the wild Thyme will be found in flower with all its Stalks entire.

Of this there are the following Varieties. The small creep-

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creeping Mother of Thyme without Scent. Narrow-leaved Mother of Thyme smelling like the Leaves of the Walnut Tree. Shrubby Mother of Thyme with pale red Flowers, and the Lemon Thyme. The last is frequently kept in Gardens for the agreeable Odour of its Leaves. But when this is propagated by Seeds, the Plants have not the same Scent; so it is an accidental Variety which is obtained by propagating it by Slips and Cuttings.

The 6th Sort has broader and smoother Leaves than the common Sort, the Stalks grow much longer, the joints are farther distant, the Heads of Flowers are larger, and the Flowers are of a brighter purple Colour. There is a Variety of this with variegated Leaves, which is propagated in Gardens, and was formerly planted for Edgings to Borders; but it is now frequently brought in Pots to the Markets to supply the London Gardens.

The 7th Sort has creeping Stalks like the common Kind, but they grow longer, and their joints are farther asunder; the Leaves are oval, smooth, and of a lucid green. The Flowers grow in close thick Whorls which are distant from each other forming a loose Spike 5 or 6 Inches long. The Flowers of this Sort are much smaller than those of the common Sort, appearing but little beyond their Empalements. This is pretty common in the Neighbourhood of Paris, but is rarely found growing naturally in England.

The 8th Sort grows naturally in the Forest of Fontainebleau in France; this has creeping slender Stalks like the first, which are garnished with small, oval, Spear-shaped hoary Leaves; the young Shoots of the same Year are also very white and hoary. The Leaves are stiffer than those of the other Sorts. The Flowers are produced in round Heads at the End of the Branches; they are of a bright purple Colour, and appear at the same Time as those of the other Sorts.

The 9th Sort grows naturally in Tartary; this is a biennial Plant. The Stalks are long, slender, and trail on the Ground; but do not emit Roots from their joints as most of the others do. The Stalks are smooth, of a light brown Colour, and are garnished with narrow Spear-shaped Leaves, which are smooth, of a light brown Colour, and are garnished with narrow Spear-shaped Leaves, which are smooth. The Stalks have small Whorls of Flowers at the Wings of the Leaves, and are terminated by oblong Heads of Flowers, whose Empalements are hoary. The Flowers are of a bright purple Colour. The whole Plant has an agreeable aromatick Scent.

All these Sorts may be easily propagated by those who are desirous to have them in their Gardens, either by Slips, or parting their Roots in the same Manner as Thyme, or their Seeds may be sown in Spring. They delight in dry undunged Ground, where they will propagate themselves by their trailing Stalks, and require no other Care but to keep them clean from Weeds.

THYME THE MARUM. See Teucrium.

THYME THE MASTICH. See Satureja.

TIARELLA. Lin. Gen. Pl. 495. Cortusa. Herm. Par. Bat. 129. Sanicle.

The Characters are,

The Flower has a permanent Empalement divided into

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5 oval acute Parts; it has 5 oval Petals the Length of the Empalement; and 10 Awl-shaped Stamina, much longer than the Petals, terminated by roundish Summits, and a bifid Germen ending with 2 Styles, crowned by single Stigmas. The Germen becomes an oblong Capsule with 1 Cell, opening with 2 Valves, containing several oval Seeds.

The Species are,

1. TIARELLA foliis cordatis. Lin. Gen. Nov. 188. Sp. Pl. 405. Tiarella with Heart-shaped Leaves. Mitella Americana, florum petalis integris. Tourn. Inst. 242. American Mitella with entire Petals to the Flower.

2. TIARELLA foliis ternatis. Lin. Gen. Nov. 188. Sp. Pl. 405. Tiarella with trifoliate Leaves. Mitella foliis ternatis. Aman. Acad. 2. p. 351. Mitella with ternate Leaves.

The 1st Sort grows naturally in North America; this has a perennial fibrous Root, which creeps and multiplies, from which come out many Heart-shaped Leaves on slender Foot Stalks, which are 3 Inches long, arising immediately from the Root. The Leaves are unequally indented on their Edges, and are of a light green Colour. The Flowers stand on slender naked Foot Stalks, which arise immediately from the Root between the Leaves, which is about 4 Inches long, and is terminated by a loose Spike of small herbaceous white Flowers which appear in May, but are seldom succeeded by Seeds in England.

This Plant is propagated by its creeping Roots which spread in the Ground, and shoot up Heads, these may be taken off and transplanted in the Autumn. It loves a moist Soil and shady Situation, and requires no other Care but to keep it clean from Weeds.

The 2d Sort grows naturally in the northern Parts of Asia; this has a perennial fibrous Root, from which spring up a few trifoliate Leaves upon Foot Stalks, these are like those of the Bilberry, but much smaller. The Stalk is slender, and rises 5 or 6 Inches high, it is rough and hairy, garnished with 2 Leaves at the Bottom, and another toward the Top, a little below the Spike of Flowers; they are angular and sawed on their Edges. The Stalk is terminated by a loose Spike of Flowers composed of 5 small white Petals, inserted in the Empalement, and 10 Awl-shaped Stamina longer than the Petals, terminated by roundish Summits. These Flowers appear early in May, but the Plants rarely produce any Seeds in England.

This Sort is propagated by parting the Root, as the former, and delights in a moist Soil and a shady Situation.

TILIA. Tourn. Inst. R. H. 611. Tab. 381. Lin. Gen. Plant. 587. The Lime, or Linden Tree; in French, Tillau or Tilleul.

The Characters are,

The Flower has a concave coloured Empalement, cut into 5 Parts; it has 5 oblong blunt Petals, crenated at their Points; and many Awl-shaped Stamina terminated by single Summits, with a roundish Germen, supporting a slender Style, the Length of the Stamina crowned by an obtuse free-cornered Stigma. The Germen afterward becomes a thick globular Capsule with 5 Cells, opening at the Base with 5 Valves, each containing 1 roundish Seed.

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The Species are,

1. *TILIA foliis cordatis acuminatis, inaequaliter serratis, fructibus quinque locularibus tomentosis.* Lime Tree, with Heart-shaped acute-pointed Leaves, unequally sawed, and a woolly Fruit having 5 Cells. *Tilia faxmina, folio minore.* C. B. P. 426. The female Lime Tree with a smaller Leaf.

2. *TILIA foliis acuminatis, serratis, subbirsutis, fructibus quadri-locularibus subpilosis.* Lime Tree with acute-pointed Leaves, which are sawed, somewhat hairy, and a hairy Fruit having 4 Cells. *Tilia foliis molliter birsutis, viminibus rubris, fructu tetragono.* Raii. Syn. 316. The red twigged Lime Tree.

3. *TILIA foliis cordatis acuminatis serratis, subtus pilosis floribus nectario instructis.* Lime Tree with Heart-shaped acute-pointed sawed Leaves hairy on their under Side, and Flowers furnished with Nectaria. This is called the American black Lime.

4. *TILIA foliis cordatis obliquis glabris subserratis cum acumine, floribus nectario instructis.* Lime Tree with Heart-shaped smooth Leaves, oblique to the Foot Stalk, somewhat sawed on their Edges, ending in acute Points, and Flowers having Nectaria. *Tilia Caroliniana, folio longius mucronato.* Rand. Cat. Hort. Chelf. Carolina Lime Tree with a long-pointed Leaf.

The 1st Sort grows naturally in the Woods in many Parts of England; of this there are two or three Varieties, which differ in the Size and Smoothness of their Leaves, some of them having much larger and rougher Leaves, than the others: I have Plants of 3 of these Varieties from Seeds, but have constantly found them vary from one to the other; and I much doubt if the second is more than a seminal Variety, but as I have not had an Opportunity of raising any of the Plants from Seeds, I cannot positively determine this.

The large leaved Dutch Lime was generally preferred to our common Sort for the Size of its Leaves, but of late Years all these Trees are little esteemed, because it is late in the Spring before their Leaves come out, and they begin to decay the first in Autumn, and when the Trees are planted in a dry Soil, their Leaves frequently decay in July, and are continually falling off, making a Litter all the remaining Part of Summer.

The 3d Sort was brought from New England, by the Title of Black Lime. The Branches of this Sort are covered with a dark brown Bark. The Leaves are large, Heart-shaped, and end in acute Points; they are deeply sawed on their Edges, and are of a deep green on their upper Side, but of a pale green and a little hairy on their under Side, standing on long slender Foot Stalks. The Flowers are produced in Bunches, in the same Manner as those of the common Lime Tree; but the Petals of the Flowers are narrower, and have Nectaria growing to their Base. The Flowers of this Sort do not appear till late in July, so are a full Month after the common Sort. The Capsules are smaller, rounder, and less hairy than those of the common Sort.

The Seeds of the 4th Sort were brought from Carolina by the late Mr. Catesby. This Tree seems to be of much smaller Growth than either of the other Sorts; the Branches spread more horizontally. The Leaves are smaller, and have a smoother Surface than

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either of the other; they are Heart-shaped, but the Mid-rib runs oblique to the Foot Stalk, so that one Side of the Leaves is much larger than the other. Their Edges are slightly sawed, and their Tops run out into long acute Points. The Bunches of Flowers stand on long slender Foot Stalks; the Petals of the Flowers are narrow and end in acute Points; these have each a narrow Nectarium fastened to their Base on the Inside, which stand erect, close to the Petals. The Flowers emit a very fragrant Odour, and are continually haunted by Bees during their Continuance. This Tree flowers toward the End of July; and, when the Season proves favourable, the Seeds ripen in Autumn.

All these Trees are easily propagated by Layers, which in one Year will take good Root, and may then be taken off, and planted in a Nursery, at 4 Feet Distance Row from Row, and 2 Feet asunder in the Rows. The best Time to lay them down, and to remove them, is at Michaelmas, when their Leaves begin to fall, that they may take Root before the Frost comes on, though they may be transplanted any Time from September to March, in open Weather, but if the Soil is dry, it is much the better Way to remove them in Autumn, because it will save a great Expence in watering them, especially if the Spring should prove dry. In this Nursery they may remain 4 or 5 Years, during which Time the Ground should be dug every Spring, and constantly kept clear from Weeds, and the large side Shoots pruned off, to cause them to advance in Height; but the small Twigs must not be pruned off from the Stems, because these are absolutely necessary to detain the Sap, for the Augmentation of their Trunks, which are apt to shoot up too slender, when they are entirely divested of all their lateral Twigs. If the Soil, in which they are planted, be a fat Loam, they will make a prodigious Progress in their Growth, so that in 3 Years Time they will be fit to transplant out where they are to remain.

They may also be propagated by Cuttings, but, as this Method is not so certain as by Layers, that Method is generally practised. In order to obtain proper Shoots for laying down, a Lime Tree is cut down close to the Ground, from the Roots of which a great Number of strong Shoots are produced the following Year; these will be strong enough to lay down the following Autumn, especially if the smallest of them are cut off close early in the Summer, for when too many Shoots are suffered to grow all the Summer, they will be much weaker, than if only a sufficient Quantity is left. The Manner of laying down these Shoots having been already directed under the Article Layers, I need not repeat it here.

There are some Persons who raise these Trees from Seeds, which, although it is a slower Way, yet when the Trees are designed to grow large, is the best Method and if they are only once transplanted, and this performed while they are young, it will be still the better Way; for all Trees, that are transplanted, are shorter lived than those which remain in the Places where they arose from Seeds, and their Timber will be sounder, and grow to a much larger Size.

When this Method is practised, the Seeds should be sown in Autumn, soon after they are ripe, on a shady Border

Border of moist light Soil, where the Plants will come up the following Spring; but, when the Seeds are kept out of the Ground till Spring, the Plants will not come up till the Year after. When the Plants appear, they should be constantly kept clean from Weeds till the following Autumn; then they should be carefully taken up, and transplanted into a Nursery, where they may grow 2 or 3 Years to get Strength, and then may be planted where they are designed to remain, for the younger they are planted out, the more they will thrive.

The Timber of the Lime Tree is used by the Carvers, it being a soft light Wood, as also by Architects for framing the Models of their Buildings; the Turners likewise use it for making light Bowls, Dishes, &c. but it is too soft for any strong Purposes.

These Trees will continue growing, and remain found a great Number of Years, and, if planted in a good loamy Soil, will grow to a considerable Bulk. I have measured 1 of these Trees, which was near 10 Yards in Girth two Feet above the Ground, and was then in a very thriving Condition; and Sir Thomas Brown mentions one of these Trees which grew in Norfolk, that was 16 Yards in Circumference, a Foot and a Half above Ground, in Height 30 Yards, and in the least Part of the Trunk it was 8 Yards and a Half.

TINUS. See Viburnum.

TITHYMALUS. *Tithymaloides*. Tourn. Inst. App. 654. *Euphorbia*. Lin. Gen. Pl. 536. Spurge.

The Characters are,

The Flower has an Empalement of 1 Leaf, indented in 3 Parts; it has 1 Petal shaped like a Slipper; it is of a thick fleshy Consistence. Under the upper Part of the Flower are situated the 10 Stamens, which are inserted in the Receptacle of the Flower; they are slender; and terminated by globular Summits; in the Center is situated a roundish three-cornered Germen, supporting 3 bifid Styles crowned by oblong Stigmas. The Germen afterward becomes a roundish Capsule having 3 Cells, each containing 1 oval Seed.

The Species are,

1. *TITHYMALUS foliis ovatis acuminatis*. Spurge with oval acute-pointed Leaves. *Tithymaloides frutescens folio myrti amplissimo*. Tourn. Inst. 654. Shrubby Bastard Spurge with a large Myrtle Leaf.

2. *TITHYMALUS foliis oblongo ovatis obtusis succulentis*. Spurge with oblong oval, obtuse Leaves which are very succulent. *Tithymaloides lauracerasi folio non serrato*. Hort. Elth. 383. Bastard Spurge with a Laurel Leaf not sawed.

The 1st Sort grows naturally near Carthage in America, from whence Mr. Robert Millar, Surgeon, sent the Branches, which were planted here, and succeeded; this rises with shrubby succulent Stalks, to the Height of 12 or 14 Feet, which are too weak to stand without Support, though they are frequently as large as a Man's little Finger, but their Leaves, being succulent, are so heavy as to weigh down their Branches, if they are not supported. The Leaves are oval, and terminate in acute Points; they are 2 Inches and a Half long, and 1 and a Half broad near their Base; they are about the Thickness of Bay Leaves, and are ranged alternately on two Sides of the Branch-

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es, to which they sit close. The Flowers are produced at the End of the Branches 3 or 4 together; they are of a scarlet Colour of one Petal, in Shape of a Slipper; these are succeeded by roundish Capsules with 3 Furrows, dividing them into 3 Cells, each containing 1 oblong Seed. The whole Plant abounds with an acrid milky Juice.

The 2d Sort grows naturally in Barbadoes, and most of the other Islands in the West-Indies, where the English Inhabitants know it by the Title of Poison Bush; this hath thick shrubby succulent Stalks, which will grow to the Height of 10 or 12 Feet; these are larger than those of the first Sort, and are garnished with oblong oval Leaves ending with blunt Points; they are above 3 Inches long, and an Inch and a Half broad in the Middle, of a very thick Consistence, and of a dark green Colour, ranged alternately on 2 Sides of the Stalk. The Flowers grow at the End of the Branches; they are shaped like those of the 1st Sort, and are of a deep red Colour; these are succeeded by roundish Capsules divided into 3 Cells, each containing 1 oblong Seed.

This whole Plant abounds with an acrid milky Juice, which will draw Blisters on the Flesh wherever it is applied, and if it mixes with the Blood, I have been credibly informed it becomes a deadly Poison; so that if the Points of Arrows or the Edges of Swords are rubbed over with this Juice, it becomes deadly to any Animal wounded with those Weapons.

These Plants are both propagated by Cuttings, which may be taken from the Plants during any of the Summer Months, and after having laid in a dry Place for a Fortnight or 3 Weeks, until the wounded Part be healed over, they should be planted into small Pots filled with light sandy Earth mixed with Lime Rubbish, and then plunged into a hot Bed of Tanners Bark, observing now and then to refresh them gently with Moisture, but they should never receive much Wet, which will rot them.

After they have taken Root, they may have a greater Share of Air by raising the Glasses, but they must never be wholly exposed to the open Air. In this Bed they may remain until the Beginning of October, when they must be removed, and placed with the Melon and Torch Thistle in a warm dry Stove, and during the Winter Season, they should have very little Water, which, if given in Plenty, seldom fails to rot them.

These Plants are too tender to thrive in the open Air in England, therefore should constantly remain in the Stove, observing in the Summer Season, when the Weather is warm, to admit a large Share of fresh Air to them, and in the Winter to place them in a warm Part of the Stove, otherwise they cannot be preserved.

They must be shifted every Summer, and fresh Earth given to them. If the Earth is light and sandy, it will require no Mixture, for rich or strong Ground is very improper for them; therefore where the Soil is inclinable to either of these, there should be a good Mixture of Sand and Lime Rubbish to prevent its binding, or detaining Moisture.

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These Plants are preserved for their odd Appearance among other succulent Plants, their Leaves being very large, thick, and full of a milky acid Juice.

TITHYMALUS. See Euphorbia.

TOAD FLAX. See Linaria

TOBACCO. See Nicotiana.

TOLUIFERA. Lin. Gen. Pl. 470. Balsam of Tolu Tree.

The Characters are,

The Flower has a Bell-shaped Empalement of 1 Leaf, slightly indented in 5 Parts at the Brim; it has 5 Petals inserted in the Receptacle of the Flower, 4 of which are narrow and equal, being a little longer than the Empalement, and the 5th is much larger, and almost Heart-shaped, having a Tail the Length of the Empalement; it has 10 short Stamina terminated by oblong erect Summits, and a roundish Germen, supporting a very short Style, crowned by an acute Stigma. The Germen afterward turns to a roundish Fruit with 4 Cells, each containing 1 oval Seed.

We have but on Species of this Genus, viz.

TOLUIFERA. Lin. Mat. Med. The Balsam Tree of Tolu. Balsamum Tolutanum, foliis ceratiae similibus. C. B. P. 401. Balsam Tree of Tolu with Leaves like those of the Carob.

This Tree grows naturally near Carthage in America, from whence the late Dr. Howfoun sent the Seeds to England: In its native Place this grows to a Tree of large Size. The Bark is very thick, rough, and of a brown Colour; the Branches spread out wide on every Side, and are garnished with winged Leaves, composed of several oblong oval Lobes placed alternately along the Foot Stalk, terminated by an odd one; these are 4 Inches long, and 2 broad in the Middle; they are rounded at both Ends, but run out to an acute Point at the Top; they are smooth, of a light green Colour, and sit close to the Foot Stalk. The Flowers are produced in small Bunches at the Wings of the Branches, each standing on a slender Foot Stalk almost an Inch long; their Empalements are of the round Bell Shape, being of 1 Leaf, which is slightly scalloped at the Brim into 5 obtuse Parts. The Flower has 4 narrow Petals of a yellow Colour, which are a little longer than the Empalement, and one more whose Tail is of the same Length of the other Petals, and the Top is of an oval Heart Shape stretched out beyond the other Parts; it has 10 short Stamina within the Tube of the Flower, which are terminated by oblong erect Summits of a Sulphur Colour, and at the Bottom of the Tube is situated a roundish Germen, having a very short Style crowned by an acute-pointed Stigma. After the Flower is past, the Germen turns to a roundish Fruit the Size of a large Pea, divided into 4 Cells, each containing 1 oblong oval Seed.

This Tree is propagated by Seeds, which must be procured from the Country where it grows naturally, and should be fresh, otherwise they will not grow. When they are gathered from the Tree, they should be put up in Sand to preserve them, for when they are sent over in Papers, the Insects generally devour them. These Seeds must be sown in Pots filled with light Earth as soon as they arrive, and plunged into the

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Tan. If it should happen in Autumn or Winter, they must be plunged in the Stove, but in Spring or Summer, they may be plunged in the Tan Bed under a Frame; they should be taken out of their Covers, otherwise they will be long in the Ground, before they vegetate. When the Plants come up, and are fit to remove, they should be carefully transplanted, each into a separate Pot, and plunged into a good hot Bed of Tanners Bark, shading them from the Sun till they have taken new Root; after which they should be treated as the Coffee Tree, with which Management the Plants will succeed.

TOMENTUM is that soft downy Substance, which grows on the Leaves of some Plants.

TORDYLIUM. Tourn. Inst. R. H. 320. Tab. 170. Lin. Gen. Pl. 293. Hartwort.

The Characters are,

It hath an umbellated Flower; the principal Umbel is composed of many small ones, which are compounded of many Rays; the involucre of the greater Umbel is composed of narrow Leaves, and is frequently as long as the Rays of the Umbel; those of the Rays are half the Length; the Umbels are diffused; the Flowers have 5 Heart-shaped inflexed Petals which are equal; they have each 5 Hair-like Stamina terminated by single Summits, and a roundish Germen, situated under the Flower, supporting 2 small Styles crowned by obtuse Stigmas. The Germen afterward turns to a roundish compressed Fruit longitudinally indented, dividing into 2 Parts, each containing 1 roundish compressed Seed with an indented Border.

The Species are,

1. TORDYLIUM umbellæ confertæ radiatæ, foliis lanceolatis inciso-serratis. Hort. Cliff. 90. Hartwort with the Rays of the Umbel closed together, and the Lobes of the Leaves Spear-shaped, and cut like Saws. Tordylium maximum. Tourn. Inst. R. H. 320. Greatest Hartwort.

2. TORDYLIUM involucri partialibus longitudine petalorum, foliis ovatis laciniatis. Hort. Cliff. 90. Hartwort with the Involucra of the Rays as long as the Petals of the Flower, and oval jagged Leaves. Tordylium Narbonense minus. Tourn. Inst. 320. The small Hartwort of Narbonne.

3. TORDYLIUM involucri umbellæ longicribus. Hort. Cliff. 90. Hartwort with longer Involucra to the Umbels. Tordylium minus, limbo granulato Syriacum. Mor. Umb. 37. Smaller Syrian Hartwort with the Borders of the Seeds granulated.

4. TORDYLIUM umbellæ confertæ radiatæ, foliis linearilanceolatis pinnato-dentatis. Hartwort with the Rays of the Umbel closed together, and linear Spear-shaped Leaves. Wing indented on their Edges. Tordylium folio longo, angusto, flore albo magno, semine elegantissime & profundissime crenato albo. Boerb. Ind. 1. 68. Hartwort with a long narrow Leaf, a large white Flower, and a white Seed elegantly and deeply crenated.

5. TORDYLIUM umbellulis remotis, foliis pinnatis, pinnis subrotundis laciniatis. Hort. Cliff. 90. Hartwort with the Umbels growing at a Distance, winged Leaves having roundish Lobes cut on their Edges. Tordylium Apulum minimum. Col. Ecph. 122. The least Hartwort of Apulia.

6. TORDYLIUM umbellulis remotis, foliis duplicatopinnatis,

pinnatis, pinnis incisissimis tomentosis. Hartwort, whose Umbels are distant from each other, and doubly-winged Leaves whose Lobes are cut and downy. *Tordylium orientale, Secacul Arabum dictum. Raywolfo. Nissl.* Eastern Hartwort by the Arabians called *Secacul*.

7. *TORDYLIUM umbellis simplicibus sessilibus, seminibus exterioribus hispidis.* Lin. Gen. Pl. 240. Hartwort with single Umbels sitting close to the Stalks, and the outer Side of the Seeds prickly. *Caucalis nodosa echinato semine.* C. B. P. Knotted Parsley.

8. *TORDYLIUM umbellâ confertâ, foliis ovato-lanceolatis pinnatifidis.* Hort. Cliff. 90. Hartwort with closed Umbels, and oval, Spear-shaped, Wing-pointed Lobes. *Caucalis semine aspero, flosculis rubentibus.* C. B. P. Hedge Parsley with a rough Seed and a reddish Flower.

The 1st Sort grows in Italy and Spain; this is a biennial Plant which dies soon after it has perfected its Seeds. The lower Leaves of this Sort are large and winged, each having 3 or 4 Pair of Lobes terminated by an odd one. The Lobes are about 3 Inches long, and 1 broad in the Middle; they are rough and hairy, having many deep Indentures on their Edges like the Teeth of a Saw; the Stalk rises 3 Feet high, sending out 2 or 3 Branches from the Side, garnished at each Joint by one winged Leaf; those on the lower Part of the Stalk have 2 Pair of small Lobes terminated by an odd one, but those toward the Top have 1 Pair, and the middle Lobe is long and narrow. The Stalk and Branches are terminated by Umbels of white Flowers, whose Rays are closed together; these are succeeded by oval compressed Seeds having a thick white Border. It flowers in June and July, and the Seeds ripen in August, or September.

The 2d Sort grows plentifully about Rome, and also in the South of France; this is mentioned in the last Edition of Ray's Synopsis as an English Plant, growing naturally in Oxfordshire where I have found it growing on the Side of Banks, but the Seeds were sown there by Mr. Jacob Bobart, Gardener at Oxford. The Leaves of this Sort are composed of 3 or 4 Pair of oval Lobes terminated by an odd one; they are soft and hairy, about 1 Inch long, and 3 Quarters broad, bluntly indented on their Edges. The Stalks rise a Foot and a Half high, and divide into 3 or 4 Branches; these have 1 small Leaf at each Joint, and are terminated by Umbels of white Flowers, composed of several small Umbels or Rays, which stand on long Foot Stalks, spreading out wide from each other. The Flowers are succeeded by smaller compressed Seeds which are bordered.

The 3d Sort grows naturally in Syria; this is a low Plant, whose Stalks seldom rise a Foot high. The lower Leaves are composed of 2 Pair of oval Lobes terminated by 1 large one; these are hairy, and slightly crenated on their Edges; they branch out into 2 or 3 Divisions, and are terminated by Umbels of white Flowers, which have large large Involucra for the most part trifid. The Points are Spear-shaped, and at their Base is situated a small Umbel composed of a few Flowers sitting very close to the Tails of the Involucra. The Flowers are succeeded by large oval, compressed, bordered Seeds.

The 4th Sort grows naturally in Sicily. The Stalks of this Sort are deeply channeled, hairy, and rough; they rise near 3 Feet high; the Leaves are composed of 2 or 3 Pair of narrow Lobes terminated by 1 long one; these are hairy, and regularly indented on their Borders in Form of winged Leaves; those on the upper Part of the Stalk have but 1 Pair of small Lobes, with a very long narrow middle Lobe, deeply and regularly indented. The Umbels, which terminate the Stalks, are small; the Rays are closely connected together; the Flowers are large and white; these are succeeded by oval, compressed, bordered Seeds, which have white Edges deeply crenated.

The 5th Sort grows naturally in Italy. The Stalks of this Sort branch out from the Bottom, and seldom rise a Foot high; they are hairy and rough. The lower Leaves are composed of 3 Pair of roundish Lobes, terminated by an odd one, which are hairy and jagged. The general Umbel is composed of 8 small ones, which stand on very long Foot Stalks, and spread out wide from each other. The Flowers are white, and the exterior Petal of each is much larger than those of the two first Sorts; these are succeeded by roundish, compressed, bordered Seeds.

The 6th Sort grows naturally about Aleppo, and in other Parts of Syria. The bottom Leaves are doubly winged, each Leaf being composed of 4 Pair of Wings terminated by an odd one. The Wings are composed of 7 oval Lobes standing alternately, which are deeply jagged; they are of a yellowish green Colour, and a little hairy. The Stalks are taper, and not channelled; they rise 2 Feet and a Half high, have a few small Hairs scattered over them, and at each Joint are garnished with one smaller-winged Leaf; they send out 1 or 2 short Branches toward the Top, and are terminated by large Umbels of yellow Flowers composed of 10 small Umbels, whose Foot Stalks are alternately longer; these spread open wide from each other. The Flowers are succeeded by compressed oval Seeds, shaped like those of Parsneps, of a yellowish Colour.

The 7th Sort grows naturally in arable Land in several of the maritime Countries in England, so is rarely admitted into Gardens; this has trailing Stalks which spread flat on the Ground, and are a Foot or more in Length. The Leaves are like those of Parsley, but they are cut into finer Segments; the Umbels of Flowers are small, and sit close to the Joints of the Stalks; the Flowers are small and white; they are succeeded by short Seeds a little compressed, and set with sharp burry Prickles on their Outside.

The 8th Sort grows naturally on the Side of Banks and Foot Paths in many Parts of England; this rises with a slender Stalk near 3 Feet high. The Leaves are like those of Parsley; their Lobes are Spear-shaped, and have winged Points; they are hairy, and stand thinly on the Stalks. The Flowers are produced in small Umbels at the Top of the Stalks, which are composed of several small Umbels or Rays, which close together; they are small, and of a pale red Colour; these are succeeded by small prickly Seeds.

All these Plants may be termed annual, because they do not live more than one Year, but some of them are called biennial, from the young Plants, which come

in Autumn, living through the Winter, and producing their Flowers and Fruits the following Summer; but, as the Seeds which are sown, and permitted to scatter, perfect their Seeds in the Compass of one Year, they should be termed annual, for this is the Property of many of the Plants with umbellated Flowers, whose Seeds should be sown in Autumn, otherwise, if they come up (which frequently does not happen the same Year when they are sown in the Spring), the Plants generally decay before the Seeds ripen; but, as their whole Growth is performed within the Year, they are esteemed as annual Plants.

They are propagated by Seeds, which should be sown in Autumn soon after they are ripe, when the Plants will soon appear, and are very hardy, so that they require no farther Care, but to keep them clear from Weeds, and where they come up too close together, they should be thinned so as to leave them 6 Inches asunder. In June following the Plants will flower, and their Seeds will ripen in August, which, if permitted to scatter on the Ground, will produce a Supply of Plants without any Trouble. If the Seeds of these Plants are kept out of the Ground till Spring, they seldom succeed, for if any Plants are produced from the Seeds then sown, they commonly perish before they have perfected their Seeds; whereas those, which are sown in Autumn, rarely fail. These Plants will grow on any Soil or Situation, so may be put into any obscure Part of the Garden.

TORMENTILLA. *Tourn. Inst. R. H. 298. Tab. 153. Lin. Gen. Pl. 153. Tormentil.*

The Characters are,

The Flower has a plain Empalement of 1 Leaf, divided into 8 Segments at the Top; it has 4 oval Heart-shaped Petals, whose Tails are inserted in the Empalement, and spread open, and many Awl-shaped Stamina inserted in the Empalement, terminated by single Summits; it has 8 small Germens collected in a Head, which have slender Styles the Length of the Germen, inserted to their Sides, crowned by obtuse Stigmas. The Germens turn to a Fruit, containing many small Seeds, included in the Empalement.

The Species are,

1. **TORMENTILLA** *caule erecto. Lin. Sp. Pl. 500.* Tormentil with an erect Stalk. *Tormentilla vulgaris. Park. Theat. 394.* Common Tormentil.

2. **TORMENTILLA** *caule repente. Lin. Sp. Pl. 500.* Tormentil with a creeping Stalk. *Pentaptyllum reptans, alatum, foliis profundius serratis. D. Plot. Oxf. 6. t. 7. Tab. 9.* Creeping-winged Cinquefoil with Leaves deeply sawed.

The 1st Sort grows wild on dry Pastures and Commons in most Parts of England, so is never cultivated in Gardens; this is so commonly known as to need no Description. The Roots of this Plant have been frequently used for tanning Leather, in Places where Oak Bark is scarce. This Root is also much used in Medicine, and is accounted the best Astringent in the whole vegetable Kingdom.

The 2d Sort is found in some particular Places of England growing wild, but particularly in Oxfordshire. The Stalks of this Sort spread on the Ground, and emit Roots from their Joints whereby they propagate very fast: This is rarely preserved unless in some Botanick Gardens for Variety. It requires no Care to propagate

these Plants, since, if their Roots are once planted in almost any Soil or Situation, the Plants will flourish without any other Care but to prevent their being over-run with great Weeds.

TOURNEFORTIA. *Lin. Gen. Pl. 176. Pittonia Plum. Gen. Nov. 5. Tab. 3.*

The Characters are,

The Empalement of the Flower is of 1 Leaf, cut into 5 small Segments at the Top and is permanent. The Flower is of 1 Petal, of the globular Bell Shape, and cut at the Brim into 5 acute Points, which spread open horizontally; it has 5 Awl-shaped Stamina, the Length of the Tube, terminated by single Summits and a globular Germen, supporting a single Style the Length of the Stamina, crowned by a single Stigma. The Germen afterward becomes a sphericul succulent Berry, inclosing 4 oblong oval Seeds resting upon the Empalement.

Father Plumier, who discovered several Species of this Genus in America, constituted this Genus, and gave it the Title of *Pittonia* in Honour of Dr. Joseph Pitton. Tournefort, Professor of Botany at Paris, and Dr. Linnaeus have changed the Title from *Pittonia* to *Tournefortia*.

The Species are,

1. **TOURNEFORTIA** *foliis ovato-lanceolatis, spicis longissimis racemosis erectis, caule fruticoso.* Tournefortia with oval Spear-shaped Leaves, long branching erect Spikes of Flowers, and a shrubby Stalk. *Pittonia racemosa nicotiana foliis foetidissimis. Plum. Gen. Nov. 5.* Branching Pittonia with foetid Tobacco Leaves.

2. **TOURNEFORTIA** *foliis ovatis petiolatis, caule hirsuto, spicis ramosissimis terminalibus. Lin. Sp. Pl. 140.* Tournefortia with oval Leaves growing on Foot Stalks, and a hairy Stalk terminated by very branching Spikes of Flowers. *Pittonia hirsutissima & ramosissima, baccis albis. Plum. Gen. Nov. 5.* The most branching hairy Pittonia with white Berries.

3. **TOURNEFORTIA** *foliis ovatis acuminatis, petiolis reflexis, caule volubili. Lin. Sp. Pl. 143.* Tournefortia with oval acute-pointed Leaves having reflexed Foot Stalks, and a twining Stalk. *Pittonia scandens, baccis nigris, nigris maculis notatis. Plum. Gen. 5.* Climbing Pittonia with white Berries marked with black Spots.

4. **TOURNEFORTIA** *foliis cordatis hirsutis, spicis racemosis reflexis, caule volubili.* Tournefortia with hairy Heart-shaped Leaves, branching reflexed Spikes of Flowers, and a twining Stalk. *Pittonia scandens racemosa, flore fusco. Houtt. Mss.* Climbing branching Pittonia with Flowers of a brown Colour.

5. **TOURNEFORTIA** *foliis cordatis subtus tomentosis, spicis racemosis brevibus, caule volubili.* Tournefortia with Heart-shaped Leaves woolly on their under Side, very short branching Spikes of Flowers, and a twining Stalk. *Pittonia scandens racemosa, foliis subrotundis subtus incanis. Houtt. Mss.* Climbing branching Pittonia with roundish Leaves hoary on their under Side.

6. **TOURNEFORTIA** *foliis ovatis rugosis petiolatis, spicis racemosis axillaribus, caule fruticoso.* Tournefortia with oval rough Leaves growing on Foot Stalks, branching Spikes of Flowers, proceeding from the Wings of the Stalks, and a shrubby Stalk. *Pittonia frutescens, folio carnosa hirsuto & obtuso. Plum. Gen. 5.* Shrubby Pittonia with a fleshy, hairy, and blunt Leaf.

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7. *TOURNEFORTIA foliis ovato-lanceolatis acutis, subtus tomentosis, spicis ramosis incurvis caule ramoso.* *Tournefortia* with oval Spear-shaped Leaves having acute Points, and being woolly on their under Side, branching incurved Spikes of Flowers, and a branching Stalk.

8. *TOURNEFORTIA foliis lanceolatis sessilibus, spicis simplicibus recurvis lateralibus.* *Lin. Sp. Pl. 141.* *Tournefortia* with Spear-shaped Leaves sitting close to the Stalks, and single recurved Spikes of Flowers growing at the Wings of the same. *Pittonia humilis ancbusa folio.* *Plum. Gen. 5.* Low *Pittonia* with an Alkanet Leaf.

The 1st Sort grows naturally in *Jamaica*, and in some of the other Islands in the *West-Indies*, where it rises with shrubby Stalks 8 or 10 Feet high, sending out many Branches, closely garnished with oval Spear-shaped Leaves placed alternately round the Stalks; they are 5 Inches long, and 2 and a Half broad in the Middle, hairy on their under Side, and stand on short Foot Stalks. The Branches are terminated by long branching Spikes of Flowers, ranged on one Side the Foot Stalks in the same Manner as those of the *Heliotrope* or *Turnsol*. Some of the Foot Stalks sustain 2, others 3, and some 4 Spikes of Flowers, which are near 5 Inches long, and are reflexed like a *Scorpion's Tail* at the Top. The Flowers are of a dirty white Colour; they are small, and closely ranged on one Side the Spike; these are succeeded by small succulent Fruit, inclosing 4 oblong Seeds in each.

The 2d Sort is also a Native of the Islands in the *West-Indies*. The Stalks of this are shrubby, taper, and rough; they rise to the Height of 8 or 10 Feet, dividing into many Branches, covered with a light, brown, hairy, rough Bark and garnished with oval Leaves placed alternately; these are about 4 Inches long, and 2 and a Half broad, having many transverse Veins running from the Mid-rib to the Sides; they have short hairy Foot Stalks, and are of a deep green on their upper Side. The Branches are terminated by very branching Spikes of Flowers; these are succeeded by small roundish succulent Fruit, each inclosing 4 oblong Seeds.

The 3d Sort grows naturally in *Jamaica*, and some of the Islands in *America*; this hath a twining ligneous Stalk, which twists about the neighbouring Trees for Support, and rises to the Height of 10 or 12 Feet, sending out several slender ligneous Branches, garnished with oval acute-pointed Leaves, whose Foot Stalks are reflexed. The Flowers are produced in branching Spikes from the Side and the Top of the Branches; they are small and white, and are succeeded by small white succulent Berries, having 1 or 2 black Spots on each.

The 4th Sort was discovered by the late Dr. *Houftoun*, growing naturally in *Jamaica*, who sent the Seeds to *England*; this hath shrubby branching Stalks, which twine about the neighbouring Trees, and rise to the Height of 10 or 12 Feet. The Branches are garnished with Heart-shaped hairy Leaves, near 3 Inches long, and one and a Half broad near their Base, ending in acute Points; they are of a thinner Texture than those of the former Species, and stand on short Foot Stalks. The Flowers come out at the End of the Branches in very slender branchy Spikes; they are small and of a dirty brown Colour, ranged along on the upper Side of the

Foot Stalk; these are succeeded by small pulpy Berries, each containing 4 Seeds.

The 5th Sort was found growing naturally by Mr. *Robert Millar* near *Cartagena* in *New Spain*; this has climbing Stalks, which twine about any neighbouring Support, and rise to the Height of 10 or 12 Feet. The Branches are garnished with Heart-shaped Leaves, 2 Inches long, and one and a Quarter broad near their Base; they are very downy on their under Side, and stand on very short Foot Stalks. The Flowers are produced in short branching Spikes which come out from the Wings of the Branches; they are of a dirty white Colour, small, and are succeeded by small succulent Berries inclosing 2, 3, and sometimes 4 Seeds.

The 6th Sort was discovered by the late Mr. *Robert Millar*, growing naturally near *Cartagena*, in *New Spain*; this has a strong ligneous Stalk which rises near 20 Feet high, sending out several strong ligneous Branches, covered with a light brown Bark which is rough, and garnished with thick oval Leaves, 4 Inches long and 3 broad; they are very rough on their upper Surface, and of a dark green Colour, but pale and smoother on their under Side, standing on pretty long Foot Stalks. The Flowers are produced in branchy Spikes from the Wings of the Branches; they are small white, and shaped like those of the other Species, and succeeded by small succulent Berries, each including 2 or 3 oblong Seeds.

The 7th Sort was discovered by the same Gentleman as the two former, and in that Country; this has woody Stalks which rise 5 or 6 Feet high, from which spring out many slender ligneous Branches, garnished with oval Spear-shaped Leaves, about 2 Inches long and 1 broad in the Middle, which are rounded at each End, but have acute Points; they are of a dark green on their upper Surface, but have a white Down on their under Side, and sit close to the Branches. The Flowers are produced from the Wings of the Stalks, and also at the Top; they are formed in slender branching Spikes, being ranged on one Side the Spikes which are recurved; they are white, and are succeeded by small succulent Berries which contain 2 or 3 Seeds.

The 8th Sort was found growing naturally at *Campachy*, by the late Dr. *Houftoun*; this Plant has low shrubby Stalks, which seldom rise more than 3 Feet high, sending out a few slender ligneous Branches, garnished with rough Spear-shaped Leaves sitting close to the Branches; these are of a dark green on their upper Side, but pale on their under. The Flowers come out in single Spikes from the Wings of the Stalk; they are white, and are succeeded by small succulent Berries like the former Sort.

These Plants are propagated by Seeds, which must be procured from the Countries where they grow naturally; these should be sown in small Pots filled with light Earth, and plunged into a hot Bed of Tanners Bark. These Seeds sometimes grow the first Year but they often remain in the Ground a whole Year; therefore, if the Plants should not come up the same Season, the Pots should be plunged in Autumn into the Tan Bed in the Stove, where they should remain all the Winter, and in the Spring they should be removed out, and plunged into a fresh Tan Bed, which will soon bring up the Plants, if the Seeds were good. When these are fit to remove they

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they should be each planted in a small Pot, and plunged into a Tan Bed, where they must be shaded from the be Sun till they have taken new Root, and then they must treated as other tender Plants from the same Countries, which require to be kept constantly in the Bark Stove.

TOXICODENDRON. Tourn. Inst. R. H. 610. Tab. 381. *Rhus*. Lin. Gen. Pl. 331. Poison Tree, vulgò.

The Characters are,

The male Flowers are upon different Plants from the female; they have a small Empalement cut into 5 Points at the Brim; and 5 small roundish Petals which spread open; they have 5 short Stamina terminated by roundish Summits. The female Flowers have Empalements and Petals like the male; they have no Stamina, but in the Center is situated a roundish Germen, supporting 3 small Styles crowned with globular Stigmas. The Germen afterward turns to a Berry with 1 or 2 Cells, inclosing 1 Seed in each.

The Species are,

1. TOXICODENDRON *foliis ternatis, foliolis obcordatis, glabris, integerrimis, caule radicante*. Poison Tree with trifoliate Leaves, having roundish, Heart-shaped smooth, entire Leaves, and a Stalk putting out Roots. *Toxicodendron triphyllum glabrum*. Tourn. 611. Smooth three-leaved Poison Tree, or Poison Oak.

2. TOXICODENDRON *foliis ternatis, foliolis ovatis inciso-angulatis pubescentibus*. Poison Tree with trifoliate Leaves whose Lobes are oval, angularly cut and covered with soft short Hairs. *Toxicodendron triphyllum, folio sinuato pubescente*. Tourn. Inst. 611. The three-leaved Poison Tree, with a soft hairy sinuated Leaf.

3. TOXICODENDRON *foliis ternatis, foliolis ovato-lanceolatis glabris caule erecto fruticoso*. Poison Tree with trifoliate Leaves, whose Lobes are oval, Spear-shaped, and smooth, and an erect shrubby Stalk. *Toxicodendron rectum, foliis minoribus glabris*. Hort. Eltb. 389. Upright Poison Tree, with smaller smooth Leaves.

4. TOXICODENDRON *foliis pinnatis, foliolis ovato lanceolatis integerrimis*. Poison Tree with winged Leaves whose Lobes are oval, Spear-shaped and entire. *Toxicodendron foliis alatis, fructu rhomboide*. Hort. Eltb. 399. Poison Tree with winged Leaves, and a rhomboidal Fruit, called Poison Ash.

5. TOXICODENDRON *foliis ternatis, foliolis ovatis crenato-dentatis glabris*. Poison Tree with trifoliate Leaves whose Lobes are oval, smooth, and bluntly indented.

6. TOXICODENDRON *foliis ternatis, foliolis ovatis inciso-sinuatis glabris, caule volubili radicante*. Poison Tree with trifoliate Leaves, whose Lobes are oval, smooth, and cut into Sinuses, and a twining rooting Stalk. *Toxicodendron amplexicaule, foliis minoribus glabris*. Hort. Eltb. 399. Poison Tree with a twining Stalk, and smaller smooth Leaves.

7. TOXICODENDRON *foliis sapius ternatis, foliolis oblongo-ovatis rugosis serratis, caule radicante*. Poison Tree with Leaves generally trifoliate, oblong, oval, rough, sawed Lobes, and a rooting Stalk.

8. TOXICODENDRON *foliis ternatis, foliolis lanceolatis superne inæqualiter serratis, subtus tomentosis, caule arborescente*. Poison Tree with trifoliate Leaves, Spear-shaped Lobes unequally sawed toward their Points, downy on their under Side, and a Tree-like Stalk, *Baccifera Indica trifoliata, fructu rotundo monopyreno, pedunculo longo*. Sloan. Cat. 170. Indian trifoliate Berry-bearing Tree with a roundish Fruit having one Seed, and a long Foot Stalk.

9. TOXICODENDRON *foliis ternatis, foliolis ovato-lanceolatis acuminatis glabris, caule fruticoso ramoso*. Poison Tree with trifoliate Leaves, having oval, Spear-shaped, acute-pointed, smooth Lobes, and a shrubby branching Stalk. *Toxicodendron arborescens pyri foliis glabris, floribus racemosis* Houst. Mss. Tree like Poison Tree with smooth Pear Leaves, and branching Flowers.

The 1st Sort grows naturally in most Parts of North America; this has a low shrubby Stalk, which seldom rises more than 3 Feet high, sending out Shoots near the Bottom which trail on the Ground, putting out Roots from their Joints, whereby it multiplies and spreads greatly, so that when it is not confined, or trained up to a Support, the Stalks seldom rise upward. If the Stalks happen to be close to a Wall they emit Roots which fasten to the Joints in the Wall, and support themselves when they are severed from the Root; and the Stalks of such Plants will become more ligneous, and rise much higher, than those which grow in the Ground. The Foot Stalks of the Leaves are near a Foot long; the Leaves are composed of 3 oval Heart-shaped Lobes, which are smooth and entire, standing on short Foot Stalks. The Lobes are 5 Inches long, and 3 Inches and a Half broad; the 2 Side Lobes are oblique to the Foot-Stalk, but the Middle one is equal; they have many transverse Veins running from the Middle to the Borders. The Flowers come out from the Side of the Stalk in loose Panicles, they are of an herbaceous Colour and small so make no great Appearance. Some Plants have only male Flowers, with 5 Stamina in each; these decay without producing Fruit; but upon other Plants there are only female Flowers, which have a Germen and 3 very short Styles; these are succeeded by roundish, channelled, smooth Berries of a gray Colour, which inclose 1 or 2 Seeds. The Plants flower in July, and the Seeds ripen in Autumn.

This Plant, when once planted in a Garden, will propagate fast enough by its trailing Branches, which put out Roots at every Part. It will thrive in almost any Soil or Situation.

The 2d Sort grows naturally in most Parts of North America. The Stalks of this Sort rise higher than those of the former; the Branches are slender but ligneous; they have a brown Bark, and are garnished with downy Leaves standing on pretty long Foot Stalks; these are composed of 3 oval Lobes about 2 Inches long, and 1 and a Half broad, indented angularly, and hoary on their under Side. The male Flowers, which are produced on separate Plants from the Fruit, come out from the Side of the Stalks in close short Spikes; these are of an herbaceous Colour, and have 5 short Stamina in each. The female Flowers are produced in loose Panicles; these are in Shape and Colour like the male, but larger, and have a roundish Germen supporting 3 very short Styles; these are succeeded by roundish Berries which ripen in Autumn.

The 3d Sort grows naturally in North America; this has a shrubby branching Stalk which rises 6 or 7 Feet high, covered with a brown Bark. The Branches are ligneous and grow erect; they are garnished with smooth trifoliate

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liate Leaves, whose Lobes are oval, Spear-shaped and have a few sinuated Indentures on their Borders; they are near 3 Inches long, and 1 and a Half broad, with several transverse Veins from the Mid-rib to their Borders. The Male and female Flowers grow on separate Plants; their Shape and Colour is like those of the former, and the Fruit is also like that.

The 4th Sort grows naturally in *Virginia, Pennsylvania, New England, and Carolina*; from all these Countres I have received Seeds and Plants of it, and it also grows in *Japan*. This, in the Countries where it grows naturally, rises with a strong woody Stalk to the Height of 20 Feet or upward, but in *England* we seldom see any of them more than 5 or 6 Feet high; the Reason of this is from the Plants being tender, so are destroyed in severe Winters, but I have seen some Plants which were kept in Pots and sheltered in Winter, upward of 10 Feet high, in the Garden of *Samuel Reynardson, Esq;* at *Hillendon*, which, after his Death, were purchased with all his other exotick Plants, by *Sir Robert Walpole*. This has a strong woody Stalk, covered with a light brown Bark inclining to gray, branching out on every Side. The Branches are garnished with winged Leaves, composed of 3 or 4 Pair of Lobes terminated by an odd one. The Lobes vary greatly in their Shape, but for the most part they are oval, Spear-shaped, about 3 Inches long, and one and a Half broad in the Middle; they are frequently rounded at their Base, but end in acute Points; their upper Surface is smooth, and of a lucid green, but their under Side is pale and a little hairy. The Foot Stalks of the Leaves change to a bright purple Colour toward the latter Part of Summer, and in Autumn all the Leaves are of a beautiful purple Colour before they fall off. The male Flowers are produced upon loose Panicles from the Wings of the Branches; they are small of an herbaceous white Colour, composed of 5 small roundish Petals, and have 5 short Stamina within, terminated by roundish Summits. The female Flowers are on separate Plants from the Male, and are disposed on loose Panicles, these are shaped like the male, but are somewhat larger, and have in their Center, a roundish Germen supporting 3 very short Styles, crowned with globular Stigmas. The Germen afterward turns to a Berry variable in Shape, sometimes almost oval, at others shaped like a small Spear; but the most general Form is roundish with a Protuberance almost like the Cicer; these include one Seed. It flowers in *July*, and in warm Seasons the female Plants produce Fruit, but they seldom ripen here.

This is undoubtedly the same Plant which is mentioned by *Dr. Kempfer* in his *Amenitates Exoticarum*, by the Title of *Sitzvel Sitz Adju, or Arbor vernicifera legitima, folio pinnato juglandis, fructu racemosa Ciceris facie. Esic. v. p. 791, 792*. The true Varnish Tree with a Walnut Tree Leaf, and a branching Fruit like Cicers. But the Figure he has exhibited of it is the most inaccurate of any perhaps to be found in any of the modern Books of Botany; it is drawn from a Side Shoot of a Branch which has been cut off, so has neither Flower or Fruit to it, and being a vigorous Shoot, the Leaves are very different in Size and Shape from those on Plants which have not been headed; and his Description of the Leaves seems to have been taken from this

Branch, otherwise he could not have compared them to those of the Walnut Tree. He seems to have been conscious of this Fault, by his adding another Figure of the Plant in small under his own; taken from a *Japan Herbal*, in which there is a much better Representation of it than his own conveys. How a Person who was employing himself in making Drawings of Plants in a Country, where the natural History of it was so little known, should make Choice of such an imperfect Sample for its Figure, is amazing, for there can be no Doubt of his meeting with perfect Plants in Flower or Fruit, in a Place where the Shrubs are cultivated so plentifully as he mentions; and in his Description of it; he sets out by comparing the Height of the Shrubs to those of Willow, than which he could not have chosen any Plant by Way of Comparison, which would have conveyed a more indetermined Idea; for it is well known there are different Species of Willow, whose Growth is from 4 to 40 Feet high; therefore there can be no other Way of reconciling his Description with what he afterward mentions, when he is giving an Account of the Method used by the Natives in collecting the Varnish; where he says the Shrubs are cut down every third Year, but by comparing their Growth with that of the Willows, which are cut down for Fuel, &c. every 4 or 5 Years.

However as the dried Samples of the Plant which he brought over agrees with the *American Toxicodendron*, and the milky Juice of both have the same Qualities of staining, so there can be no Doubt of the Plants being the same; therefore if it is thought that Varnish may be of publick Utility; it may be collected in Plenty in most of the *English Settlements in North America*.

Kempfer has also given a Figure and Description of a spurious Varnish Tree, which is called *Fasi no-Ki* by the Natives, and is by him titled *Arbor vernicifera spuria, sylvestris angustifolia*. Spurious wild Varnish Tree with a narrow Leaf, which he says agrees with the other in every Part, excepting the Lobes of the Leaves which are narrower. This led me into a Mistake in the former Editions of the *Gardeners Dictionary*, by supposing their Difference might arise from Culture only; but having since raised from Seeds a Shrub which has all the Appearance of his spurious Varnish Tree, and is evidently a distinct Species, if not of a different Genus from the true Sort, I am certain *Kempfer* has been guilty of a great Mistake in this Particular. The Seeds of this were sent from *China*, for those of the Varnish Tree; but when I sowed them, I remarked they were pretty much like those of the Beech Tree, but smaller; being thick on one Side and narrow on the other, in Shape of a Wedge, from whence I supposed there were 3 of the Seeds included in 1 Capsule. There is a Shrub of this Kind now growing in the *Chelsea Garden*, which is more than 12 Feet high, but as it has not yet produced Flowers, I am at a Loss where to range it.

The 5th Sort grows naturally in *North America*, from whence the Seeds were a few Years since brought to *England*; this has a shrubby Stalk which sends out many ligneous Branches covered with a smooth purple Bark, and garnished with smooth trifoliate Leaves, standing on Foot Stalks an Inch long; the Lobes are oval, about 2 Inches

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Inches long, and one and a Half broad in the Middle of a deep lucid green on their upper Side but of a pale green on their under, and are deeply crenated or indented on their Edges, their Base joining close to the Foot Stalks. The Leaves, when bruised, emit an Odour like that of orange Peel, from whence the Gardeners have titled it the sweet-scented *Toxicodendron*. The male Flowers are produced in short close Panicles; they are small, and of an herbaceous white Colour; they grow on separate Plants from the Fruit, which grow in sparfed Panicles, and are of an oval Shape.

The 6th Sort grows naturally in *North America*. The Stalks of this Sort emit Roots their whole Length, whereby they fasten to Trees or any neighbouring Support, and climb to the Height of 6 or 8 Feet; these are garnished with trifoliate oval Leaves, which are smooth and cut into Sinuses on their Edges. The Lobes are 4 Inches long and 2 broad. The Flowers are produced in short Panicles from the Side of the Branches; they are male and female on different Plants like the other Species.

The 7th Sort was sent me by Mr. *John Bartram* from *Philadelphia*, by the Title of Great *Toxicodendron*; this hath trailing Roots which run near the Surface of the Ground, sending up Stalks in different Places; the Leaves stand on long Foot Stalks; they have chiefly 3 Lobes, but some have 4. The Lobes are obtuse, rough, and sawed on their Edges. They are 4 or 5 Inches long, and 3 broad; this Sort has not as yet flowered in *England*, so I can give no farther Description of the Plant at present; these Sorts are all of them so hardy as to thrive in the open Air in *England*, but the 4th Sort is often destroyed by severe Frost, so should be planted in a warm Situation.

The 1st, 6th, and 7th Sorts propagate in Plenty by their creeping Stalks and Roots; the others are propagated by laying down their Branches, which will put out Roots in one Year, and may then be taken off and transplanted, either in the Places where they are to remain, or in a Nursery to grow 2 or 3 Years to get Strength before they are planted out for good; they are also propagated by Seeds, which should be sown on a Bed of light Earth, and when the Plants come up, they must be kept clean from Weeds the following Summer; and before the Frost comes on in Autumn, the Bed should be hooped over, that the Plants may be covered with Mats, for otherwise the early Frosts will kill their Tops, which frequently causes their Stalks to decay to the Ground; for as the Plants are tender and generally shoot late the first Year; they are in much greater Danger than when they get more Strength. In Spring the Plants may be transplanted into Nursery Beds to grow a Year or two, and may then be transplanted for good.

These Plants are preserved by the Curious in Botany, for Variety; but as there is little Beauty in them, there are not many of the Sorts cultivated in *England*. The Wood of these Trees, when burnt, emits a noxious Fume, which will suffocate Animals when they are shut up in a Room where it is burnt; an Instance of this is mentioned in the *Philosophical Transactions* by Dr. *William Sberard*, which was communicated to him in a Letter from *New England* by Mr. *Mow*, in which

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he mentions some People who had cut some of this Wood for Fuel, which they were burning, and in a short Time they lost the Use of their Limbs, and became stupid; so that if a Neighbour had not accidentally opened the Door, and seen them in that Condition, it is generally believed they would soon have perished. This should caution People from making use of this Wood for such Purpose.

When a Person is poisoned by handling this Wood, in a few Hours he feels an itching Pain, which provokes a Scratching, which is followed by an Inflammation and Swelling. Sometimes a Person has had his Legs poisoned, which have run with Water. Some of the Inhabitants of *America* affirm, they can distinguish this Wood by the Touch in the Dark, from its extreme Coldness, which is like Ice; but what is mentioned of this poisonous Quality, is most applicable to the fourth Sort here mentioned; which, by the Description, agrees with this Species.

The Juice of the Tree is milky when it first issues out of the wounded Part; but soon after it is exposed to the Air, it turns black, and has a very strong foetid Scent, and is corroding; for I have observed, on cutting off a small Branch from one of these Shrubs, that the Blade of the Knife has been changed black in a Moment's Time, so far as the Juice had spread over it; which I could not get off without grinding the Knife.

The 8th Sort grows naturally in *Jamaica* on the red Hills, and *Campeachy* in great Plenty. It has a thick woody Stem which rises near 30 Feet high, with a smooth Ash-coloured Bark, sending out ligneous Branches on every Side which have a hairy rusty-coloured Bark, and are garnished with trifoliate Leaves, which have hairy Foot Stalks 2 Inches long. The Lobes are Spear-shaped, about 4 Inches long, and 2 broad in the Middle, drawing to Points at both Ends; they are unequally sawed toward the Top, and have many transverse Veins running from the Mid-rib to the Borders; they are of a dark green on their upper Side, but have a brown woolly Down on their under Side. The Flowers are ranged in a single Racemus, which springs from the Wings of the Branches; they are small, of a yellowish Colour, and the female Flowers are succeeded by small oval Berries of an Orange Colour when ripe.

The 9th Sort grows naturally about *Carthage* in *New Spain*; this rises with a shrubby Stalk 12 or 14 Feet high, covered with a gray Bark, sending out a great Number of Branches on every Side, which are garnished with trifoliate smooth Leaves, whose Lobes are oval, Spear-shaped, and oblique to their Foot Stalks, they are near 3 Inches long, and an Inch and a Half broad, running out in long acute Points. The male and female Flowers are on different Plants; they are formed in loose Panicles, are small, and of a dirty white Colour. The female Flowers are succeeded by small, oval, smooth Berries, each including 1 Seed.

The 2 last Sorts are tender Plants, so will not thrive in this Country, without the Assistance of Artificial Heat; they are propagated by Seeds when these can be procured from the Countries where the Plants grow naturally. These should be sown as soon as they arrive here, in Pots filled with light Earth and plunged into a Tan Bed. Sometimes the Plants will come up the same

Year,

Year, but the Seeds often lie long in the Ground when they are sown in the Spring, and when they do not grow the first Year, the Pots should be plunged in the Bark Bed in the Stove in Autumn, where they may remain all the Winter, and in the Spring they should be plunged into a fresh hot Bed under a Frame, which will soon bring up the Plants. When these are fit to remove, they should be each planted in a small Pot, filled with light Earth, and plunged into a new Tan Bed, observing to shade them from the Sun till they have taken new Root, then they should be treated as other tender exotick Plants, which are constantly kept in the Bark Stove.

TRACHELIUM Tourn. Inst. R. H. 130 Tab. 50. Lin. Gen. Pl. 204. Throatwort.

The Characters are.

The Flower has a small Empalement cut at the Top in 5 Parts, sitting upon the Germen. The Flower has 1 Petal which is Funnel-shaped, having a long slender, cylindrical Tube, cut at the Top into 5 small oval Segments, which spread open; it has 5 Hair-like Stamina the Length of the Petal terminated by single Summits; and a roundish three-cornered Germen situated under the Flower, supporting a long slender Style crowned by a globular Stigma. The Germen afterward turns to a roundish obtuse Capsule with 3 Lobes, having 3 Cells, filled with small Seeds.

We have but one Species of this Genus in the English Gardens. viz.

TRACHELIUM Hort. Ups. 41. Throatwort. *Trachelium azureum umbelliferum*. Pon. Bul. 44. Blue Mountain Throatwort.

This Plant grows naturally in shady Woods in many Parts of Italy. It has a perennial Root which is fleshy and tuberous, sending out many Fibres which spread wide on every Side. The Leaves are oval, Spear-shaped, about 2 Inches long, and one broad in the Middle, sawed on their Edges, and ending in acute Points. The Stalks rise a Foot and a Half high, and are garnished with Leaves, shaped like those at the Bottom, but come out irregularly. Sometimes there are 2 pretty large Leaves, and one or two smaller rising from the same Point; at others, 1 large and 3 smaller at the same Joint; these come out alternate, and the upper Part of the Stalk, immediately under the Umbel, is naked of Leaves, except 2 or 3 narrow ones, which are close to the Foot Stalks of the Flowers; these are disposed in form of an Umbel composed of many small Umbels. The Flowers are small Funnel-shaped, and of an azure blue Colour; these appear in June and July, and are succeeded by roundish Capsules, with 3 Cells filled with small Seeds, which ripen in September.

This Plant is propagated by Seeds, which should be sown in Autumn soon after they are ripe, for when they are kept out of the Ground till Spring, they frequently fail, or if they do grow, it is not before the following Spring. When the Plants come up, they should be kept clean from Weeds, and as soon as they are big enough to remove, they should be transplanted on an East aspected Border of light undunged Earth, placing them in Rows 6 Inches apart, and 4 Inches distant in the Rows, shading them from the Sun till they have taken new Root, after which they require no other Care but to keep

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them clean from Weeds till Autumn, when they may be transplanted into the Borders of the Flower Garden, where they will flower the following Summer.

But as these Plants thrive better on old Walls, when by Accident they have arisen there from Seeds, so their Seeds, when ripe, may be scattered on such Walls, as are old, or where there is Earth lodged sufficient to receive the Seeds; where the Plants will come up and resist the Cold much better, and continue longer than when sown in the full Ground; and when a few of the Plants are established on the Walls, they will shed their Seeds, so that they will maintain themselves without any farther Care. I have observed some Plants of this Kind, which have grown from the Joints of a Wall, where there has not been the least Earth to support them; which have resisted the Cold, though they have been greatly exposed to the Winds, when most of those in the full Ground were killed; so that these Plants are very proper to cover the Walls of Ruins, where they will have a very good Effect.

TRADESCANTIA. Lin. Gen. Plant. 360. *Ephem. merum*. Tourn. Inst. R. H. 367. Tab. 193. Spiderwort.

The Characters are,

The Flower has a disordered Sheath. The proper Empalement is permanent and composed of 3 oval concave Leaves. The Flower has 3 roundish equal Petals which spread open, 6 hairy slender Styles, terminated by Kidney-shaped Summits, and an oval obtuse Germen with 3 Corners, supporting a slender Style, crowned by a 3 cornered blunt Stigma. The Germen turns to an oval Capsule shut up in the Empalement, having 3 Cells containing a few angular Seeds.

We have but one distinct Species of this Genus, viz.

TRADESCANTIA. H. C. 127. Spiderwort. This is the *Ephem. Virginianum flore caeruleo majori*. Tourn. *Virginianum* with a larger blue Flower.

This Genus had the Title of *Ephem. merum* given it by Tournefort, because the Flower continued but one Day before it faded. Dr. Linnæus has altered it to *Tradescantia*, after John Tradescant, who brought the Plant from Virginia, where it grows naturally.

The Root is composed of several fleshy Fibres, which spread wide on the Ground, from which arise many long, narrow, keeled Leaves, which embrace each other at their Base; they are about half an Inch broad at the Bottom, and gradually lessen to a Point; they are veined and rough on their Edges, of a grayish Colour and succulent; between the Leaves arises a thick jointed Stalk about a Foot long, garnished at each Joint with one Leaf, whose Base embraces it. At the Top of the Stalk are 2 Leaves which spread asunder; above these come out many Flowers almost in a Sort of Umbel; these have a three-leaved Empalement, and 3 large roundish Petals of a deep blue Colour, which in the Morning spread open flat, but in the Middle of the Day they shrink up, and do not open again, but there is a Succession of Flowers from the same Bunch daily, for a considerable Time. The Germen swells to a roundish Capsule with 3 Angles having 3 Cells including a few angular Seeds. It flowers in June, and there is commonly a Succession of Flowers for 2 Months on the same Plant, especially in cool moist Seasons.

We have two other Varieties of this Plant, one with

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a white

a white, the other has a purple Flower ; but these are supposed changeable from Seeds.

It is easily propagated by Seeds, which, if permitted to scatter, will produce plenty of young Plants the following Spring, or if the Seeds are sown soon after they are ripe, the Plants will come up the Spring after ; and when fit to remove, they should be planted in a Nursery Bed, at 9 Inches Distance, and the Ground kept clean from Weeds. In Autumn they should be removed into the Borders of the Flower Garden, where they will flower and produce Seeds, and the Roots will continue several Years.

TRAGACANTHA. *Tourn. Inst. R. H.* 417. *Tab.* 234. *Astragalus.* *Lin. Gen. Pl.* 799. Goats-thorn.

The Characters are,

The Empalement of the Flower is of 1 Leaf, indented in 5 Parts, the lower Segments being the shortest. The Flower is of the Butterfly Kind ; the Standard is long, erect, indented at the Point, and the Borders are reflexed. The Wings are shorter than the Standard. The Keel is of the same Length with the Wings, and is indented ; it has 10 Stamina 9 are joined and 1 is separated, terminated by roundish Summits, and a short taper Germen supporting an Awl-shaped Style crowned by an obtuse Stigma. The Germen afterward becomes a short swelling Pod, having 2 longitudinal Cells, inclosing Kidney-shaped Seeds.

The Species are,

1. **TRAGACANTHA** *petiolis longioribus spinescentibus. foliis ovatis obtusis.* Goats-thorn with longer Foot Stalks, ending in Spines and having oval obtuse Lobes to the Leaves. This is the *Tragacantha*. *C. B. P.* 388. Goats-thorn.

2. **TRAGACANTHA** *foliolis lanceolatis, floribus solitariis axillaribus, siliculis ovatis inflatis.* Goats-thorn with Spear-shaped Lobes, Flowers proceeding singly from the Sides of the Branches, and oval, inflated, Bladder Pods. *Tragacantha humilis* *Balearica, foliis parvis vix incanis, flore albo.* *Salvador.* Low Goats-thorn of the *Balearick* Islands, having small Leaves, which are scarce hoary, and a white Flower.

3. **TRAGACANTHA** *foliolis lanceolatis acuminatis tomentosis, floribus alaribus terminalibusque.* Goats-thorn with Spear-shaped acute-pointed, woolly Leaves and Flowers growing on the Sides, and at the Ends of the Branches. *Tragacantha orientalis humillima argentea barbæ Jovis folio.* *Tourn. Cor.* 29. The lowest eastern Goats-thorn with silvery Leaves like those of *Jupiter's* Beard.

4. **TRAGACANTHA** *foliolis linearibus glabris, floribus congestis axillaribus.* Goats-thorn with very narrow smooth Leaves, and Flowers growing in Clusters on the Sides of the Branches. *Tragacantha foliis minimis viridibus.* *Boerb. Ind. Alt.* 2. p. 53. Goats-thorn with the least very green Leaves.

The 1st Sort grows naturally on the Sea Shore about *Marseilles*, and in *Italy* ; this hath a thick, short, ligneous Stalk, which branches out greatly on every Side. The young Branches are woolly ; they are closely garnished with winged Leaves, whose Foot Stalks end in acute Thorns. The Lobes are small, oval, obtuse, and of a silvery Colour. The Flowers are large, white, and shaped like a Butterfly, they are produced in Clusters at the end of the Branches, these appear in June and July, and are succeeded by short Pods having

two longitudinal Cells, containing 2 or 3 Kidney-shaped Seeds, which seldom ripen in *England*.

The 2d Sort grows naturally in the Islands of *Majorca* and *Minorca* ; this hath a thick woody Stalk which rises about 2 Feet high, sending out many ligneous Branches, closely garnished with Spear-shaped small Leaves ; they are hoary, and are ranged by Pairs along a very strong Foot Stalk ending with a very sharp Point. The Flowers are produced singly from the Sides of the Branches ; they are large and white ; these are succeeded by oval Bladder Pods containing four Kidney-shaped Seeds ; it flowers in *July*, but the Seeds do not ripen in *England*.

The 3d Sort grows naturally in the Islands of the *Archipelago* ; this has a very low shrubby Stalk which divides into many downy Branches, garnished with winged Leaves, composed of 9 or 10 Pair of Spear-shaped woolly Lobes which end in acute Points ; these are extended to the End of the Foot Stalk, so there is not any Part of it bare at the End, as in the other Species. The Flowers are produced from the Side and at the Top of the Branches ; they are white and shaped like those of the other Species, but smaller ; they appear at the same Time as the former Sorts, but are not succeeded by Pods in *England*.

The 4th Sort grows naturally in *Spain* ; this is a very low Plant. The Stalks are pretty thick and woolly, but seldom rise more than 5 or 6 Inches high, dividing into several Branches, closely garnished with small winged Leaves composed of several Pair of small linear Lobes which are smooth, and of a bright green Colour. The Foot Stalks of these end in very sharp Thorns, which stand out beyond the Lobes ; the Flowers grow in Clusters from the Side of the Stalks ; they are smaller than those of the other Species, and are of a dirty white Colour ; these appear in *July*, but are not succeeded by Seeds in *England*.

These Sorts may be propagated by Seeds, which must be procured from the Countries where the Plants grow naturally ; these should be sown on a Bed of fresh Earth in *April*, and when the Plants come up, they should be carefully kept clean from Weeds, which, if permitted to grow among the Plants, would soon overbear and destroy them, while they are young. If the Season should prove very dry, it will be of great Service to water the Plants now and then, and when they are large enough to transplant, they should be carefully taken up, and some of them planted in small Pots filled with fresh Earth, placing them in the Shade until they have taken Root ; after which Time they may be removed into an open Situation, where they may remain till the latter End of *October*, when they should be placed under a common Frame, where they may be sheltered from severe Frost, but may have free Air in mild Weather, when the Glasses should not be put over them.

The Remainder of the Plants may be planted on a warm dry Border, where they must be shaded until they take Root, and if the Season should continue dry, they must be refreshed with Water, otherwise they will be in Danger, because, while they are so young, their Roots will not have established themselves in the Ground sufficiently to nourish them in great Droughts.

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Those Plants which were planted in Pots, may be preserved for a Year or two under Frames in Winter, until they have obtained Strength, when they may be shaken out of the Pots, and planted in a lean dry Soil, and a warm Situation, where they will endure the Cold of our ordinary Winters very well; but, as they are sometimes destroyed by hard Winters, it will be proper to keep a Plant of each Kind in Pots, which may be sheltered in Winter to preserve the Species.

These Plants may be propagated by Slips, for as they rarely produce Seeds in this Country, the latter Method is generally used here. The best Time for this Work is in April, just as the Plants begin to shoot, at which Time the tender Branches of the Plants should be slipped off, and their lower Parts divested of the decayed Leaves; then they should be planted on a very moderate hot Bed, which should be covered with Mats, to screen them from the great Heat of the Sun, by Day, and the Cold by Night. These Cuttings should be frequently, but gently, watered until they have taken Root, after which they may be exposed to the open Air, observing always to keep them clear from Weeds, and in very dry Weather they must be refreshed with Water.

On this Bed they may remain until the following Spring, where if the Winter should be very severe, they may be covered with Mats as before, and in April they may be transplanted out either into Pots filled with sandy light Earth, or into warm Borders, where, if the Soil be dry, gravelly, and poor, they will endure the severest Cold of our Climate, but if they are planted in a very rich Soil, they often decay in Winter.

From one Species of this Genus, Monsieur Tournefort says, the Gum Adragant, or Dragon, is produced in Crete, of which he gives the following Relation in his Voyage to the Levant: "We had the Satisfaction of fully observing the Gum Adragant on Mount Ida. I cannot understand how Bellonius comes to assert so positively, that there is no such Thing in Candia; sure he had not read the first Chapter of the ninth Book of Theophrastus's History of Plants! the little bald Hillocks about the Sheepfold produce much of the *Tragacantha*, and that to a very good Sort. Bellonius, and Prosser Alpinus, were doubtless acquainted with it, though it is hardly possible, from their Descriptions, to distinguish it from the other Kinds they make Mention of. This Shrub spontaneously yields the Gum Adragant towards the End of June, and in the following Months, at which Time, the nutritious Juice of this Plant, thickened by the Heat, bursts open most of the Vessels wherein it is contained. It is not only gathered in the Heart of the Trunk and Branches, but also in the Interspaces of the Fibres, which are spread in the Figure of a Circle like Rays of the Sun. This Juice is coagulated into small Threads, which, passing through the Bark, issue out by little and little, according as they are protruded by the fresh Supplies of Juice arising from the Roots. This Substance, being exposed to the Air, grows hard, and is formed either in Lumps, or slender Pieces, curled and winding in the Nature of Worms, more or less long, according as Matter offers. It seems as if the Coaction of the Fibres of this Plant contributes to the

expressing of the Gum. These delicate Fibres, as fine as Flax, being uncovered, and trodden by the Feet of the Shepherds and Horsea, are by the Heat shriveled up, and facilitate the Emanation of the extravasated Juices.

This Gum should be light, and of a transparent white Colour; it should have no Taste or Smell, and in small Pieces of different Figures and free from all Kinds of Dirt or Filth. When this is dissolved in Water, it is used to give a Body to several Medicines; it is also much used by the Painters.

But notwithstanding what Tournefort has said concerning the Gum Adragant being produced from one particular Species, many Authors are of Opinion, that it is taken from several other Species, but particularly that of *Marseiller*, from whence that Gum is often brought into England.

At present these Plants are rarely preserved, excepting by some Persons who are curious in Botany, yet in large Gardens many of them deserve a Place, where, if they are planted on Hillocks, or the Slopes of dry Banks, they will have a very good Effect, especially those which retain their Leaves through the Year.

TRAGIA. Plum. Gen. Nov. 14. Tab. 12. Lin. Gen. Pl. 930.

The Characters are,

It hath male and female Flowers in the same Plant. The Emplacement of the male Flowers is cut into 3 oval acute-pointed Segments which spread open; it has no Petals, but there are 3 Stamina in each, the Length of the Emplacement, terminated by roundish Summits. The Emplacement of the female Flowers are permanent; they are cut into 5 oval concave Segments. The Flowers have no Petals or Stamina, but a roundish Germen, having 3 Furrows, supporting an erect Style crowned by a trifid spreading Stigma. The Germen afterward turns to a roundish three-lobed Capsule having 3 Cells, each containing 1 globular Seed.

The Species are

1. *TRAGIA foliis cordato-oblongis, caule volubili.* Lin. Sp. Pl. 980. *Tragia* with oblong Heart-shaped Leaves, and a twining Stalk. *Tragia scandens, longo botanica folio.* Plum. Gen. Nov. 14. Climbing *Tragia* with a long Betony Leaf.

2. *TRAGIA involucriis fœmineis pentaphyllis pinnatifidis.* Lin. Sp. Pl. 980. *Tragia* with five-leaved Involucria to the female Flowers which are Wing-pointed. *Ricinocarpus Zeylanica hirsuta, foliis lanceolatis serratis.* Burm. Zeyl. 202. Hairy *Ricinocarpus* of Ceylon with Spear-shaped sawed Leaves.

The Title of this Genus was applied to it by Father Plumier, who constituted the Genus to the Honour of Hieronymus Bock, an ancient Botanist, who was commonly called *Tragus*.

The 1st Sort grows plentifully in the Savannas in Jamaica, and the other warm Parts of America, where it twines round whatever Plants or Trees it grows near, and rises 7 or 8 Feet high, having tough woody Stems. The Leaves are oblong and Heart-shaped; they are an Inch and a Half long, and three Quarters of an Inch broad toward their Base, ending in acute Points, and are deeply sawed on their Edges, standing alternately on pretty long Foot Stalks. The male Flowers come out from the Wings of the Stalk in long Bunches

of about 2 Inches in Length; the female Flowers are produced on separate Foot Stalks arising from the same Point as the male; these are succeeded by roundish Capsules with 3 Cells each inclosing 1 roundish Seed. The whole Plant is covered with burning Spines, like those of the Nettle, which renders it very unpleasant to handle.

The 2d Sort grows naturally in India; this rises with an erect ligneous Stalk, about 3 Feet high, which rarely sends out any Side Branches; it is garnished with oblong Spear-shaped Leaves, which run out in very long acute Points, and are sharply sawed on their Edges; these are ranged alternately on the Stalk, and are closely covered with yellowish stinging Hairs. The Flowers are produced in small Clusters from the Wings of the Stalk, standing several together on the same Foot Stalk; the upper are all male, and the under female, and the latter are succeeded by roundish Capsules with 3 Cells, each inclosing 1 Seed.

As these Plants are of no great Beauty, they are seldom preserved in this Country, except in some Botanick Gardens for Variety, they are propagated by Seeds, which must be sown on a hot Bed early in the Spring, and must afterward be transplanted into Pots, and plunged into a hot Bed of Tanners Bark, and treated as other tender Plants, which require to be kept in the Bark Stove.

TRAGOPOGON. Tourn. Inst. R. H. 477. Tab. 270. Lin. Gen. Pl. 810. Goats-beard; in French, Barbe de Bœuf.

The Characters are,

The common Empalement of the Flower is single, and composed of 8 acute-pointed Leaves, which are alternately large, and joined at their Base. The Flower is composed of many hermaphrodite Florets, which are uniform; they are of one Petal stretched out like a Tongue, indented at their Points in 5 Parts, and lie over each other like the Scales of Fish; these have each 5 short Hair-like Stamina terminated by cylindrical Summits, and an oblong Germen, situated under the Floret, supporting a slender Style, the Length of the Stamina, crowned by 2 revolving Stigmas. The Empalement of the Flower afterward swells to a Belly inclosing many oblong, angular, rough Seeds, slender at both Ends, crowned by a feathery Down.

The Species are,

1. TRAGOPOGON calycibus corollæ radiis æquantibus, foliis integris strictis. Lin. Sp. Pl. 789. Goats-beard with an Empalement equal to the Rays of the Flower, and entire closed Leaves. *Tragopogon pratense luteum majus*. C. B. P. 274. Greater yellow Meadow Goats-beard.

2. TRAGOPOGON calycibus corollæ radiis longioribus, foliis linearibus strictis. Goats Beard with the Empalement longer than the Rays of the Flower, and linear closed Leaves. *Tragopogon pratense luteum minus*. Hort. R. Blas. Smaller yellow Meadow Goats-beard.

3. TRAGOPOGON calycibus corollæ radiis longioribus, foliis integris strictis, pedunculis supernè incrassatis. Hort. Ups. 243. Goats-beard with the Empalement longer than the Rays of the Flower, entire closed Leaves, and the Foot Stalk thicker at the upper Part. *Tragopogon purpureo-ceruleum pomi folio, quod arisi vulgò*. C. B. P. 274. Goats-beard of a purple blue Colour, and a Leek Leaf, commonly called Salsafy.

4. TRAGOPOGON calycibus corollæ radiis longioribus, foliis integris, seminibus levibus, discis plumosis, radiis fetacis. Hort. Ups. 243. Goats beard with an Empalement longer than the Rays of the Flower, entire Leaves, and smooth Seeds, those of the Disk being covered with a feathery Down, and those on the Borders bristly. *Tragopogon alterum gramineo folio, flore sua verubente*. Column. Ecpbr. II. p. 232. Another Goats-beard with a Grass Leaf, and a soft red-coloured Flower.

5. TRAGOPOGON calycibus corollæ radio brevioribus, foliis linearibus strictis, caule hirsuto. Goats-beard with the Empalement shorter than the Rays of the Flower, narrow closed Leaves, and a hairy Stalk. *Tragopogon hirsutum*. C. B. P. 274. Hairy Goats-beard.

6. TRAGOPOGON calycibus, corollæ brevioribus aculeatis, foliis pinnato-hastatis. Hort. Cliff. 382. Goats-beard with prickly Empalements shorter than the Petals, and Arrow-Wing-pointed Leaves. *Sonchus asper laciniatus Creticus*. C. B. P. 124. Rough Sowthistle of Crete with jagged Leaves.

The 1st Sort grows naturally in the Meadows of Austria and Germany; this is very different from the Sort which grows naturally in England, for I have sown the Seeds of both Sorts several Years in the same Bed of Earth, and have always found the Plants have retained their Difference. The lower Leaves are three Quarters of an Inch broad at their Base, where they embrace the Stalk; they are more than a Foot long, and are closed together, ending in acute Points. The Stalk rises near 3 Feet high, which is garnished at each Joint with one Leaf of the same Shape with those below, but smaller; it is terminated by one large yellow Flower composed of hermaphrodite Florets which lie over each other like the Scales of Fish; these are included in one common simple Empalement, equal in Length to the Rays of the Flower. Each Floret is succeeded by an oblong Seed which is larger at the Base than at the Point, where it is crowned with a large feathery Down. The Seeds of the Border or Ray are crooked and rough, but those of the Disk are strait and smooth. It flowers in June, and the Seeds ripen about a Month after.

The 2d Sort grows naturally in moist Pastures in many Parts of England; it is by the common People titled Sleep-at-noon, or Go-to-bed-at-noon, because the Flowers are generally closed up before that Time every Day. The lower Leaves of this Sort are almost as long as those of the first Sort, but are not more than a third Part so broad; they are of a deep green Colour, and end in acute Points. The Stalks rise about a Foot high, and sustain 1 yellow Flower at the Top, not more than half so large as those of the first; the Empalements of these Flowers are longer than the Rays; the Seeds of this are much smaller. It flowers about the same Time with the former.

When this Sort is shot up in Stalk 4 Inches high, the common People gather it out of the Fields, and boil it the same Way as Asparagus, and some give it the Preference.

The 3d Sort is cultivated in Gardens by the Title of Salsafy. The Roots of this are dressed in different Ways, and served up to the Table, and of late Years there are some Persons who cultivate it for the Stalks, which

which are out in the Spring when they are 4 or 5 Inches high, which are dressed like Asparagus, as the second Sort. The Stalks of this are much longer, and are tenderer than the other, so are better for this Purpose; the Leaves are broad; the Flowers are large and blue; the Foot Stalk immediately under the Flower is much thicker than below, and the Empalement is longer than the Rays of the Flower.

The 4th Sort grows naturally in *Italy*; this is of low Stature. The Stalks seldom rise a Foot high; the Leaves are long and narrow; the Flowers are small, and of a pale red or Peach Blossom Colour; the Empalement is much longer than the Rays of the Flower, and the Seeds are smooth.

The 5th Sort grows naturally in *Istria*; this has narrow Leaves a little hairy. The Stalks rise about a Foot and a half high, and are naked most Part of their Length; they are very hairy, and sustain one pretty large yellow Flower whose Empalement is much shorter than the Rays of the Flower, and is also very hairy.

The 6th Sort grows naturally in *Crete*, and also in *Italy*; this is an annual Plant very like the Sowthistle in Stalk and Leaf, but the Empalement of the Flower is prickly. It is seldom admitted into Gardens, because the Seeds are waisted by the Winds to a great Distance, and thereby fill the Garden with Weeds.

These Plants are propagated from Seeds, which should be sown in *April* on an open Spot of Ground, in Rows about 9 or 10 Inches Distance, and when the Plants are come up, they should be hoed out, leaving them about 6 Inches asunder in the Rows. The Weeds should also be carefully hoed down as they are produced, otherwise they will soon overbear the Plants, and spoil them. This is all the Culture required, and if the Soil be light, and not too dry, the Plants will have large Roots before Winter, at which Time the Salsafy, whose Roots are eaten at that Season, will be fit for Use, and may be taken up any Time after their Leaves begin to decay, but when they begin to shoot again, they will be sticky, and not fit for Use, but many Persons cultivate this Sort for the Shoots, as was before mentioned.

The common yellow Sort, whose Shoots are sold in the Market, will be fit for Use in *April* or *May*, according to the Forwardness of the Season. The best Time to cut them is, when their Stems are about 4 Inches long, for if they stand too long, they are never so tender as those which are cut while young.

Some People in cultivating these Plants sow their Seeds in Beds pretty close, and when they come up, they transplant them out in Rows at the before mentioned Distance; but as they form a Tap Root, which abounds with a milky Juice, when the extreme Part of their Roots is broken by transplanting they seldom thrive well afterward; therefore, it is by far the better Way to make shallow Drills in the Ground, and scatter the Seeds therein, as before directed, whereby the Rows will be at a due Distance, and there will be nothing more to do than to hoe out the Plants when too thick in the Rows, which will be much less Trouble than the other Method of transplanting, and the Plants will be much larger and fairer.

TRAGOSELINUM. See *Pimpinella*.

TRANSPANTING OF TREES. See *Planting*.

TRANSPORTATION OF PLANTS: In sending Plants from one Country to another, great Regard should be had to the proper Season for doing it; for Example, If a Parcel of Plants are to be sent from a hot Country to a cold one, they should be sent in the Spring of the Year, that, as they come toward the colder Parts, the Season may be warmer, and if they have suffered a little in their Passage, there will be Time to recover them before Winter, whereas those which arrive in Autumn, are often lost in Winter, because they have not Time to recover, and get Root, before the Cold comes on.

On the contrary, those Plants, which are sent from a cold Country to a hot one, should always be sent in the Beginning of Winter, that the Cold may prevent their shooting during their Passage, and that they may arrive Time enough to be rooted before the great Heats come on, otherwise they will soon perish.

The best Way to pack up Plants for a Voyage (if they are such as will not bear to be kept out of the Ground) is to have some strong Boxes with Handles to them, for the more easily removing them in bad Weather; these should have Holes bored in their Bottoms to let out the Moisture, otherwise it will rot the Roots of the Plants. Over each of these Holes should be laid a flat Tile, or Oyster Shell, to prevent the Earth from stopping them; then they should be filled up with Earth, into which the Plants should be set as close as possible, in order to save Room, which is absolutely necessary, otherwise they will be very troublesome in the Ship, and as the only Thing intended is to preserve them alive, and not to make any Progress while on their Passage, a small Box will contain many Plants, if rightly planted. The Plants should also be placed in the Box a Fortnight or three Weeks before they are put on board the Ship, that the Earth may be a little settled about their Roots, and during the Time they are on board, they should remain, if possible, on the Deck, that they may have Air, but in bad Weather they should be covered with a Tarpawlin to guard them against the Salt Water and Spray of the Sea, which will destroy them, if it comes at them in any Quantity.

The Water these Plants should have, while on board, must be proportioned to the Climate whence they come, and to which they are going. If they come from a hot Country to a cold one, then they should have very little Moisture, after they have passed the Heats; but, if they are carried from a cold Country to a hot one, they must have a greater Share of Moisture when they come into a warmer Climate, and should be shaded in the Day from the violent Heat of the Sun, to which if they are too much exposed, it will dry them up, and destroy them.

But if the Plants to be sent from one Country to another are such as will live out of the Ground a considerable Time, as all those which are full of Juice will do; as the Sedums, Ficoides, Euphorbiums, Cereuses, &c. then they require no other Care but to pack them up in a close Box, wrapping them up well with dry Moss, observing to place them so closely that they may not be tumbled about, which will bruise them; and that those Plants which have Spines may not wound any of the

the others. The Box also should be placed where they may receive no Moisture, and where Rats cannot come to them, otherwise they are in Danger of being eaten by those Vermin; but if these Plants are packed too close, they are apt to ferment, and thereby either rot, or at least grow sickly; to prevent which, they should have a good Quantity of dry Hay or Straw laid between them; and several small Holes should be made in the Boxes, to let out the noxious Air.

If these Plants are thus carefully packed up, they will grow though they should be two, three, or some Sorts, if they are four or five Months on their Passage; and will be less liable to suffer than if planted in Earth, because the Sailors generally kill these Plants by over watering them.

There are also several Sorts of Trees, which may be packed up in Chests with Moss about them, which will bear to be kept out of the Ground two or three Months, provided it be at a Season when they do not grow; as may be seen by the Orange Trees, Jasmines, Capers, Olive, and Pomegranate Trees, which are annually brought from Italy; and if skilfully managed, very few of them miscarry, notwithstanding they are many Times kept three or four Months out of the Ground.

In sending Seeds from one Country to another, the great Care to be taken is, to secure them from Vermin, and preserve them dry, otherwise they mould and decay. The Method Mr. Catesby always observed was, to put up his Seeds dry into Papers, and then put them into a dry Gourd Shell, and seal them up; in which Way he sent several large Parcels of Seeds from Carolina to England, which never miscarried. There are some Persons who have directed to put them into Glasses, and to seal them closely down, to keep out the external Air; but from several Experiments of this Kind which I have made, I find Seeds thus closely put up will not grow, if they remain stopp'd up any considerable Time, all Seeds requiring some Share of Air, to preserve their vegetating Quality; so that where a Person has no other Convenience, they may be put up in a Bag, and hung up in a dry Part of the Ship, or put into a Trunk, where they may be safe from Vermin; in which Places they will keep very well.

N. B. It is the safest Way to bring all Sorts of Seeds in their Pods or Husks, in which they grew, provided they are put up dry; because their own Covering will afford them some Nourishment, if the Seeds are not separated from the Placenta.

TRIBULUS. *Tourn. Inst. R. H. 265. Tab. 141. Lin. Gen. Pl. 476. Caltrops.*

The Characters are
The Empalement of the Flower is cut into 5 acute Parts which are a little shorter than the Petals; there are 5 oblong blunt Petals to the Flower which spread open, and 5 small awl-shaped Stamina terminated by single Summits, and an oblong Germen, the Length of the Stamina, having no Style but crowned by a beaded Stigma. The Germen afterwards turns to a roundish prickly Fruit, divided into 5 Capsules, armed with 3 or 4 Thorns, angular on one Side, joining together. The Cells are transverse, and contain 2 or 3 Pear-shaped Seeds.

The Species are,
1. TRIBULUS foliis sexjugatis subaequalibus. *Hort.*

Cliff. 160. Caltrops with 6 Pair of Lobes to each Leaf which are almost equal. Tribulus terrestris, folio ciceris, fructu aculeato. C. B. P. 250. Land Caltrops with a Chick Leaf, and a prickly Fruit.

2. TRIBULUS foliis quadrijugis exterioribus majoribus. *Lin. Sp. Pl. 386. Caltrops with 4 Pair of Lobes to each Leaf, of which the outer are the largest. Tribulus terrestris major, flore maxime odorato. Sloan. Cat. Jam. 93. Greater Caltrops with the largest sweet Flower.*

3. TRIBULUS foliis octojugatis subaequalibus. *Lin. Sp. Pl. 387. Caltrops with 8 Pair of Lobes to each Leaf which are almost equal. Tribulus terrestris major Curassavicus. Par. Bat. 236. Greater Land Caltrops of Curasso.*

The 1st Sort is a very common Weed in the South of France, in Spain, and Italy, where it grows among Corn, and on most of the arable Land, and is very troublesome to the Feet of Cattle; for the Fruit, being armed with strong Prickles, run into the Feet of the Cattle, which walk over the Land. This is certainly the Plant which is mentioned in Virgil's *Georgicks*, under the Name of *Tribulus*, though most of his Commentators have applied it to other Plants.

It is called in English Caltrops, from the Form of the Fruit, which resembles those Instruments of War that were cast in the Enemies Way to annoy their Horses.

This hath a slender fibrous Root, from which spring out 4 or 5 slender Stalks which spread flat on the Ground; they are hairy, and extend a Foot and a Half in Length; these are garnished at each Joint with winged Leaves, composed of 6 Pair of narrow hairy Lobes, almost of equal Size; those on the lower Part of the Stalk stand alternately, but toward the Top they are placed opposite. The Flowers come out from the Wings of the Stalk, standing on short Foot Stalks; they are composed of 5 broad obtuse yellow Petals which spread open. In the Center is situated an oblong Germen, crowned by a beaded Stigma, attended by 10 short Stamina terminated by single Summits. The Flowers appear in June and July, which are succeeded by roundish, five-cornered, prickly Fruit, which, when ripe, divide into 5 Parts, each having a transverse Cell containing 1 or 2 Seeds, which ripen in August and September.

This Plant is preserved in several curious Gardens in England, for Variety. It is propagated by Seeds, which should be sown in Autumn, for those, which are kept out of the Ground till Spring, commonly remain in the Ground a whole Year, before they come up. These Seeds should be sown on an open Bed of fresh light Earth, where they are designed to remain, for, as it is an annual Plant, it doth not bear transplanting very well, unless it be done when the Plants are very young. In the Spring, when the Plants come up, they should be carefully cleared from Weeds, and where they come up too close, some of the Plants should be pulled out to give Room for the remaining Plants to grow; after this they will require no other Culture, but to keep them clear from Weeds. In June they will begin to flower, and their Seeds will ripen in August and September, which, if permitted to scatter, the Plants will come

come up the following Spring, and maintain their Place, if not overborne with Weeds.

The 2d Sort grows naturally in *Jamaica*, and some of the other Islands in the *West-Indies*; this is an annual Plant, with pretty thick compressed channelled Stalks which trail on the Ground, and are near two Feet long, garnished with winged Leaves placed by Pairs opposite; these are sometimes composed of 3 but most commonly of 4 Pair of Lobes, the outer being the largest; they are smooth, and sit close to the Foot Stalk. The Flowers come out from the Wings of the Stalk; they are composed of 5 large yellow Petals, which spread open, and have an agreeable Odour; these are succeeded by roundish prickly Fruit ending in a long Point, but seldom ripen in *England*.

The 3d Sort grows naturally in the *West-Indies*; it was found by the late Dr. *Houssoun* at the *Havanna*; this has a ligneous Root, from which spring out many Stalks which are hairy, jointed, and trail on the Ground; these are garnished at each Joint by winged Leaves, which differ greatly in Size, one of the Leaves at each being composed of 8 Pair of oblong Lobes nearly equal, and opposite to this comes out a small Leaf composed of but 4 Pair of Lobes. The large Leaves stand alternately on the Stalks, and the small ones on the opposite Side; the Stalks are near 2 Feet long, and at the Wings of the Stalks come out the Foot Stalks of the Flowers, which are hairy, and near 2 Inches long, each sustaining 1 pale yellow Flower, composed of 5 large Petals, which have narrow Tails, but are very broad and rounded at their Points. The Flowers are succeeded by roundish Fruit armed with very acute Spines, but these rarely ripen in *England*.

The 2 last Sorts, being Natives of hot Countries, are very tender, so must be sown on a hot Bed early in the Spring, and when the Plants are come up, they must be each transplanted into a separate Pot filled with rich light Earth, and then plunged into a hot Bed of Tanners Bark, where they must be treated as other tender exotick Plants, being careful to bring them forward as early as possible in the Summer, otherwise they will not perfect their Seeds in this Country.

The 3d Sort will live through the Winter, if it is plunged in the Bark Stove, and treated as other tender Plants, and the following Summer they will flower earlier, so there will be more Time for the Seeds to ripen.

TRICHOMANES, Maiden-hair

There are 3 or 4 Varieties of this Plant, which grow naturally in *Europe*, but in *America* there is a great Number of Species, remarkably different from each other, as also from the *European* Kinds.

These, being of the Tribe of Ferns, or capillary Plants are seldom preserved in Gardens. Their Roots should be planted in moist shady Places, especially the *European* Sorts, which commonly grow from between the Joints of old Walls, and in other very moist shady Situations; but those Sorts, which are brought from hot Countries, must be planted in Pots filled with Rubbish, and strong Earth mixed, and Winter they must be screened from hard Frosts, to which, if they are exposed, it will destroy them.

The common Sort in *England* is generally sold in the Markets for the true Maiden-hair, which is a very diffe-

rent Plant, and not to be found in *England*, it being a Native of the South of *France*, and other warm Countries, so is rarely brought to *England*.

TRICHOSANTHES. *Lin. Gen. Pl.* 966. *Anguina. Michel. 9.*

The Characters are,

It has male and female Flowers at separate Distances on the same Plant. The male Flowers have a long smooth Empalement of 1 Leaf, cut into 5 small Segments at the Top which are reflexed; the Petal is plain, spreading, and cut into 5 Parts ending in long branching Hairs; they have 3 short Stamina, arising from the Point of the Empalement, terminated by cylindrical erect Summits joined in a Body, and 3 small Styles fastened to the Empalement. The female Flowers sit on the German, and have Empalements and Petals like the male Flowers, but have no Stamina; they have a long slender German, situated under the Flower, supporting a Style the Length of the Empalement, crowned by 3 oblong Stigmas. The German turns to a long succulent Fruit having 3 Cells inclosing many compressed Seeds.

We have but one Species of this Genus in the *English* Gardens, viz.

TRICHOSANTHES pomis teretibus oblongis. *Hort. Cliff. 450.* *Tricosanthes* with a taper, oblong, incurved Fruit. *Anguina Sinensis flore albo elegantissimo, fructu oblongo intorto. Michel. Gen. 12. Tab. 9.* *China* Serpent Cucumber with a most elegant white Flower, and an oblong intorted Fruit.

This Plant grows naturally in *China*, it is an Annual, and of the Cucumber Tribe. The Stalks run to a great Length, and if they are not supported, trail on the Ground, as Cucumbers and Melons. The Leaves are angular and rough; the Flowers come out from the Side of the Stalks; they are white, and cut into many small Filaments or Threads. The Fruit is taper, near a Foot long, incurved, and divided into 3 Cells, which include many compressed Seeds like those of Cucumber.

It is propagated by Seeds, which must be sown on a hot Bed early in the Spring, and afterwards treated as Cucumbers and Melons, keeping them covered with Glasses, otherwise they will not ripen their Fruit here.

TRICHOSTEMA. *Gron. Flor. Virg. 64. Lin. Gen. Pl. 652.*

The Characters are,

It has a liped Empalement to the Flower of 1 Leaf; the upper Lip is twice as large as the under, and is cut into 3 equal acute Segments, the under Lip into two. The Flower is of the Lip Kind, it has a very short Tube; the upper Lip is compressed and hooked, and the under Lip is cut into 3 Parts, the Middle one being the least; it has 4 Hair-like Stamina which are long and incurved, two of them being a little shorter than the other, terminated by single Summits, and a four-pointed German, supporting a long slender Style, crowned by a bifid Stigma. The German turns to 4 roundish Seeds inclosed in the swollen Empalement of the Flower.

The Species are,

1. TRICHOSTEMA flaminibus longissimis exsertis. *Lin. Sp. Pl. 598.* *Trichostema* with the longest stretched out Stamina. *Cassila mariana, majoranae folio. Pet. Suc. 243.* *Maryland* Scull Cap with a Marjoram Leaf.

2. *TRICHOSTEMA flaminibus brevibus inclusis.* Lin. Sp. Pl. 598. *Trichostema* with shorter Stamina included in the Petal. *Teucrium Virginianum Origani folio.* Hort. Elt. 380. *Virginia* Germander with a wild Marjoram Leaf.

The 1st Sort grows naturally in many Parts of *North America*; it is an annual Plant, which rises about 6. or 8 Inches high, dividing into small Branches garnished with small roundish Leaves, not unlike those of sweet Marjoram; these are placed opposite, and are covered with fine, small, downy Hairs. The Flowers are produced at the Wings of the Branches; they are small, and of a purple Colour gaping with two Lips; the upper Lip is arched, and is much larger than the lower; it is cut into 3 acute Points; the lower Lip is small, and cut into 2 Points. These appear late in *August*, so that unless the Season proves warm, the Seeds will not ripen in *England*.

The 2d Sort grows naturally in *Virginia*; this hath an herbaceous branching Stalk, which rises from 9 Inches, to a Foot high; it has 4 Angles and the Leaves stand by Pairs on the Branches; they are shaped like those of the wild Marjoram, and are a little hairy, sitting close to the Branches. The Flowers are produced at the Top of the Branches; they are small, and of a purple Colour. The 4 Stamina stand within the Tube of the Flower; these Flowers do not appear till the End of Summer, so the Seeds seldom ripen here.

They are propagated by Seeds, which should be sown in Pots filled with light Earth, in Autumn; and in Winter the Pots should be placed under a Frame to shelter them from severe Frost, but should be exposed to the open Air at all Times, when the Weather is mild. In the Spring the Plants will appear; and when they are fit to remove, they should be planted on a Bed of light Earth, shading them from the Sun till they have taken fresh Root, then they will require no other Culture but to keep them clean from Weeds.

TRIDAX. Lin. Gen. Pl. 872. *After.* Houss. Mss. *American Starwort.*

The Characters are,

The Flower has a common cylindrical imbricated Empalement. The Scales are acute-pointed, and erect. The Flowers are composed of hermaphrodite Florets in the Disk, and the Rays are of female half Florets. The hermaphrodite Florets are Funnel-shaped, of 1 Petal, and cut at the Brim into 5 Points, these have 5 short Hair-like Stamina, terminated by cylindrical Summits joined together, and an oblong crowned Germen, supporting a bristly Style, crowned by an obtuse Stigma. The Germen afterward becomes an oblong single Seed, crowned with a simple Down. The female half Florets are plain, of 1 Petal, and cut into 3 Segments at the Top; these have an oval Germen like the hermaphrodite Florets, but no Stamina, and are succeeded by single Seeds of the same Shape.

We know but one Species of this Genus, viz.

TRIDAX. Hort. Cliff. 418. This is the *After procumbens*, flore ocreoleuco, foliis laciniatis & hirsutis. Houss. Mss. Trailing Starwort with a whitish Copper Coloured Flower, and hairy jagged Leaves.

This Plant was discovered by the late Dr. *Houstoun*, growing naturally by the Road Side leading to old *La Vera Cruz*, in *America*. The Stalks of this trail on

the Ground, and emit Roots at their Joints, whereby it spreads, and propagates; they are herbaceous, and hairy, and are garnished with rough hairy Leaves placed by Pairs, and are about an Inch and a Half long, and three Quarters of an Inch broad, ending in acute Points, and are acutely jagged on their Edges. The Flowers are produced on long naked Foot Stalks, which terminate their Branches. They have a common Empalement, composed of oval Scales, ending in acute Points, which lie over each other like the Scales of Fish; within which are ranged many female half Florets, which compose the Border or Rays, and a good Number of hermaphrodite Florets, which form the Disk or Middle; these are of a pale Copper Colour, inclining to white, and are each succeeded by a single oblong Seed, crowned with Down.

This Plant is propagated by Seeds, which should be sown in Pots, and plunged into a hot Bed, and when the Plants come up and are fit to remove, they should be each planted in a small Pot filled with light Earth, and plunged into a hot Bed of Tanners Bark, observing to shade them from the Sun till they have taken new Root, then they must afterward be treated as other tender Plants from the *West-Indies*, placing them in the Bark Stove in Autumn, where they should constantly remain.

It may also be propagated by its trailing Stalks, which frequently put out Roots at their Joints; if these are cut off and planted, they will make new Plants. This Plant does not produce Flowers in Plenty here, and but rarely perfects its Seeds in *England*.

TRIFOLIUM. Tourn. Inst. R. H. 404. Tab. 228. Lin. Gen. Pl. 802. Trefoil; in French, *Trèfle*.

The Characters are,

The Flower has a tubulous permanent Empalement of 1 Leaf. The Flower is of the Butterfly Kind, and is frequently permanent, drying in the Empalement. The Standard is reflexed, the Wings are shorter than the Standard, and the Keel is shorter than the Wings; it has 10 Stamina, 9 are joined, and 1 is separate, terminated by single Summits; and an almost oval Germen supporting an Awl-shaped Style, crowned by a single Stigma. The Germen afterward becomes a short Pod with 1 Valve, containing a few roundish Seeds.

There are great Numbers of Species of this Genus, several of which grow naturally in *England*, and others in several Parts of *Europe*; but, as many of them are Plants of small Estimation, I shall select only such of them as are cultivated either for Use or Beauty.

The Species are,

1. *TRIFOLIUM caule erecto, foliis oblongo-ovatis integerrimis, spicis ovatis, calycibus setaceis.* Trefoil with an erect Stalk, oblong, oval, entire Leaves, and oval Spikes of Flowers. *Trifolium purpureum, majus, pratense simile.* Roy. Syn. 328. The Red or Dutch Clover.

2. *TRIFOLIUM capitulis umbellatis leguminibus tetraspermis, caule repente.* Lin. Sp. Pl. 767. Trefoil with umbellated Heads, Pods having 4 Seeds, and a creeping Stalk. *Trifolium pratense album.* C. B. P. 327. White Meadow Trefoil, Honeyfuckle Grass, or white Dutch Clover.

3. *TRIFOLIUM spicis ovalibus imbricatis, vexillis deflexis persistentibus, calycibus nudis, caule erecto.* Flor. Suec.

Succ. 617. Trefoil with oval imbricated Spikes of Flowers, having deflexed permanent Standards, naked Empalements, and an erect Stalk. *Trifolium pratense luteum, capitulo lupuli vel agrarium.* C. B. P. Yellow Meadow Trefoil, or Hop Clover.

4. *TRIFOLIUM spicis imbricatis, vexillis deflexis persistentibus, calycibus pedicellatis, caulibus procumbentibus.* Lin. Sp. Pl. 773. Trefoil with imbricated Spikes of Flowers, having deflexed permanent Standards, Empalements standing on Foot Stalks, and trailing Stalks. *Trifolium luteum, lupulinum, minimum.* Hist. Ox. 2. 142. The least yellow Hop Trefoil, called None-such, or Black Seed.

5. *TRIFOLIUM spicis ovatis calycibus foliatis, caule erecto villosa, foliis lanceolatis.* Trefoil with oval Spikes of Flowers, having leafy Empalements, an erect hairy Stalk, and Spear-shaped Leaves. *Trifolium pratense hirsutum majus, flore albo sulphureo, seu ochroleucum.* Raii. Cat. Cant. Greater hairy Meadow Trefoil with a whitish Sulphur or Copper-coloured Flower, commonly called Trefoil.

6. *TRIFOLIUM spicis villosis oblongis obtusis apophyllis, foliis subrotundis.* Flor. Leyd. 380. Trefoil with oblong blunt hairy Spikes of Flowers without Leaves, and roundish Lobes. *Trifolium spica oblonga rubra.* C. B. P. 328. Trefoil with an oblong red Spike.

7. *TRIFOLIUM spicis villosis longis, corollis monopetalis, caule erecto, foliis serrulatis.* Lin. Sp. Pl. 763. Trefoil with long hairy Spikes, Flowers having one Petal, an erect Stalk, and Leaves very slightly sawed. *Trifolium montanum, spica longissima rubente.* C. B. P. 328. Trefoil of the Mountains, with very long red Spikes of Flowers.

8. *TRIFOLIUM spicis villosis conico-oblongis, dentibus calycinis setaceis, subaequalibus, foliis linearibus.* Hort. Cliff. 375. Trefoil with oblong conical hairy Spikes, having bristly Indentures to the Empalements, which are almost equal, and linear Lobes to the Leaves. *Trifolium montanum, angustissimum, spicatum.* C. B. P. 238. Spiked Mountain Trefoil with the narrowest Leaves.

9. *TRIFOLIUM spicis villosis ovalibus, dentatis calycinis setaceis aequalibus.* Hort. Cliff. 375. Trefoil with oval hairy Spikes and bristly Indentures to the Empalements which are equal. *Trifolium arvense humile spicatum sive lagopus.* C. B. P. 328. Hares Foot Trefoil.

10. *TRIFOLIUM capitulis subrotundis, calycibus inflatis bidentatis reflexis, caulibus repentibus.* Hort. Cliff. 373. Trefoil with roundish Heads, reflexed Bladder Empalements with two Teeth, and a creeping Stalk. *Trifolium fragiferum friscum.* C. B. P. 329. Strawberry Trefoil.

11. *TRIFOLIUM leguminibus racemosis nudis dispermis, caule erecto.* Hort. Cliff. 376. Trefoil with long naked Bunches of Pods containing 2 Seeds; and an erect Stalk. *Melilotus officinarum Germaniae.* C. B. P. 331. Common Melilot.

12. *TRIFOLIUM spicis oblongis, leguminibus seminudis mucronatis, caule erecto.* Hort. Cliff. 375. Trefoil with oblong Spikes, half naked acute-pointed Pods, and an upright Stalk. *Lotus bortenensis odora.* C. B. P. 330. Sweet Trefoil.

The 1st Sort, which is well known in England, by the Title of red Clover, needs no Description; this has been frequently confounded with the red Meadow Trefoil by

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the Botanists, who have supposed they were the same Species; but I have often sown the Seeds of both in the same Bed, which have constantly produced the two Species without varying. The Stalks of the Meadow Trefoil are weak and hairy, the Stipulae which embrace the Foot Stalks of the Leaves are narrow and very hairy; the Heads of Flowers are rounder and not so hairy as those of the Clover, whose Stalks are strong, almost smooth, furrowed, and rise twice the Height of the other; the Heads of Flowers are large, oval, and hairy: The Petal of the Flowers open much wider, and their Tubes are shorter than those of the other, but the Clover has been so much cultivated in England for near a Hundred Years past, that the Seeds have been scattered over most of the English Pastures, so that there are few of them which have not Clover mixed with the other Grasses, and this has often deceived the Botanists, who have supposed that the Meadow Trefoil has been improved to this by dressing the Land.

Since the red Clover has been cultivated in England, there has been great Improvement made of the Clay Lands, which before produced little but Rye Grass, and other coarse Bents; which by being sown with red Clover, have produced more than six Times the Quantity of Fodder, they had formerly on the same Land, whereby the Farmers have been enabled to feed a much greater Stock of Cattle, than they could before, which has enriched the Ground, and prepared it for Corn; and where the Land is kept in Tillage, it is the usual Method now among the Farmers, to lay down their Ground with Clover, after having had two Crops of Corn, whereby there is a constant Rotation of Wheat, Barley, Clover, or Turnips, on the same Land. The Clover Seed is always sown with the Barley in the Spring, and when the Barley is taken off, the Clover spreads and covers the Ground, and this remains two Years, after which the Land is ploughed again for Corn.

The Clover is a biennial Plant, whose Roots decay after they have produced Seeds; but by eating it down, or mowing it when it begins to flower, it causes the Roots to send out new Shoots, whereby the Plant is continued longer, than it would naturally. The common Allowance of Seed for an Acre of Ground is ten Pounds. In the Choice of the Seeds, that which is of a bright yellow Colour inclining to brown should be preferred; and the pale-coloured thin Seed should be rejected. The Clover Seed should be sown after the Barley is harrowed in, otherwise it will be buried too deep; and after the Seeds are sown, the Ground should be rolled, which will press the Seeds into the Ground; but this should be done in dry Weather, for Moisture will often cause the Seeds to burst, and when the Ground is wet, the Seeds will stick to the Roll. This is the Method which is generally practised by most People in sowing this Seed with Corn; but it will be much better if sown alone; for the Corn prevents the Growth of the Plants until it is reaped, and taken off the Ground; so that one whole Season is lost; and many Times, if there be a great Crop of Corn on the Ground, it spoils the Clover; so that it is hardly worth standing; whereas, when it is sown without any other Seed, the Plants will come up more equal, and come on much faster than that which was sown the Spring before, under Corn.

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Therefore from many Years Trial, I would advise the Seeds to be sown in *August*, when there is a Prospect of Rain soon after; for as the Ground is at that Season warm, so the first Shower of Rain will bring up the Plants, and these will have Time enough to get Strength before the Winter: And if, some Time in *October*, when the Ground is dry, the Clover is well rolled, it will press the Ground close to the Roots, and cause the Plants to send out more Shoots; the same should be repeated in *March*, which will be found very serviceable to the Clover. The Reason of my preferring this Season for sowing the Seeds rather than the Spring is, because the Ground is cold and wet in Spring, and if much Rain fall after the Seeds are sown, they will rot in the Ground; and many Times when the Seed is sown late in the Spring, if the Season should prove dry, the Seeds will not grow; so that I have always found the other Season has been the best.

About the Middle of *May* this Grass will be fit to cut, when there should be great Care taken in making it; for it will require a great deal more Labour and Time to dry than common Grass, and will shrink into less Compass; but if it be not too rank, it will make extraordinary rich Food for Cattle. The Time for cutting it is when it begins to flower; for if it stands much longer the lower Part of the Stems, and the under Leaves will, begin to dry, whereby it will make a less Quantity of Hay, and that not so well flavoured.

Some People cut three Crops in one Year of this Grass; but the best Way is to cut but one in the Spring, and feed it the remaining Part of the Year, whereby the Land will be enriched, and the Plants will grow much stronger.

One Acre of this Plant will feed as many Cattle as 4 or 5 Acres of common Grass; but great Care should be taken of the Cattle, when they are first put into it, lest it burst them: To prevent which, some turn them in for a few Hours only at first, and so stint them as to Quantity; and this by Degrees, letting them at first be only one Hour in the Middle of the Day, when there is no Moisture upon the Grass, and so every Day suffer them to remain a longer Time, until they are fully seasoned to it; but great Care should be had never to turn them into this Food in wet Weather; or if they have been for some Time accustomed to this Food, it will be proper to turn them out at Night in wet Weather, and let them have Hay, which will prevent the ill Consequences of this Food; but there are some who give Straw to their Cattle while they are feeding upon this Grass, to prevent the ill Effects of it; which must not be given them in the Field, because they will not eat it where there is Plenty of better Food. There are others who sow Rye Grass amongst their Clover, which they let grow together, in order to prevent the ill Consequences of the Cattle feeding wholly on Clover; but this is not a commendable Way, because the Rye Grass will greatly injure the Clover in its Growth, and the Seeds will scatter and fill the Ground with Bents.

Where the Seeds are designed to be saved, the first Crop in the Spring should be permitted to stand until the Seeds are ripe, which may be known by the Stalks and Heads changing to a brown Colour; then it should be cut in a dry Time; and when it is well dried, it may be

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housed until Winter, if the Seeds are not wanted before, when the Seeds should be threshed out; but if the Seeds are wanted for immediate sowing, it may be threshed out before it be housed or stacked; but then it must be well dried, otherwise the Seeds will not quit their Husks.

It has been a great Complaint among Farmers, that they could not thresh out these Seeds without great Labour and Difficulty; which I take to be chiefly owing to their cutting the Spring Crop when it begins to flower, and so leave the second Crop for Seed, which ripens so late in Autumn, that there is not Heat enough to dry the Husks sufficiently; whereby they are tough, and the Seeds rendered difficult to get out; which may be entirely remedied by leaving the first Crop for Seed, as hath been directed; and then the Ground will be ready to plough, and prepare for Wheat the same Year, which is another Advantage.

When Cattle are fed with this Hay, the Best Way is to put it in Racks, otherwise they will tread a great Quantity of it down with their Feet. This Feed is much better for most other Cattle than Milch Cows, so that these should rarely have any of it, lest it prove hurtful to them; though when it is dry, it is not near so injurious to any Sort of Cattle as when green.

The 2d Sort grows naturally in most of the Pastures in *England*, and is generally known among the Country People, by the Title of white Honeyfuckle.

This is an abiding Plant, whose Branches trail on the Ground, and send out Roots from every Joint; so that it thickens and makes the closest Sward of any of the sown Grasses; and it is the sweetest Feed for all Sorts of Cattle yet known; therefore when Land is designed to be laid down for Pasture, with Intent to continue so, there should always be a Quantity of the Seeds of this Plant sown with the Grass Seeds. The usual Allowance of this is eight Pounds to one Acre of Land; but this should never be sown with Corn; for if there is a Crop of Corn, the Grass will be so weak under it, as to be scarce worth standing; but such is the Covetousness of most Farmers, that they will not be prevailed on to alter their old Custom of laying down their Grounds with a Crop of Corn, though they lose twice the Value of their Corn, by the Poorness of the Grass, which never will come to a good Sward, and one whole Season is also lost; for if this Seed is sown in the Spring without Corn, there will be a Crop of Hay to mow by the Middle, or latter End of *July*, and a much better After-feed for Cattle the following Autumn and Winter, than the Grass which is sown with Corn will produce the second Year. The Seed of this Sort may also be sown with Grass Seeds in Autumn, in the Manner before directed for the common red Clover; and this autumnal Sowing, if the Seeds grow kindly, will afford a good early Crop of Hay the following Spring; and if, after the Hay is taken off the Land, the Ground is well rolled, it will cause the Clover to mat close upon the Ground, and become a thick Sward.

The Seed of this white *Dutch* Clover is annually imported from *Flanders*, by the Way of *Holland*; from whence it received the Name of *Dutch* Clover; not that it is more a Native of that Country than of this; for it is very common in moist Pastures in every County in *England*; but the Seeds were never collected for sowing here.

here till of late Years; nor are there many Persons at present here, who save this Seed, although it may be done, if the same Care as is practised for the red Clover, is taken with this Sort; therefore it should be recommended to every Farmer, who is desirous to improve his Land, carefully to sow an Acre or two of this white Clover by itself for Seeds; which will save him the Expence of buying the Seeds, which are often sold at a great Price; and there will be no Want of Sale for any Quantity they may have to spare.

The farther Account of this Grass, may be seen under the Article *Pasture*.

The 3d Sort grows naturally among the Grasses in most of the upland Pastures in this Country: but the Seeds are frequently sold in the Shops by the Title of Hop Clover, and are by many People mixed with the other Sorts of Clover and Grass Seeds, for laying down Ground to Pasture; this grows with upright branching Stalks about a Foot high, garnished with trifoliate Leaves, whose Lobes are oblong, and Heart-shaped, but reversed; the narrow Point joining the Foot Stalks. The Flowers grow from the Wings of the Stalk on long Foot Stalks; they are collected into oval imbricated Heads; they are yellow, and have naked Empalements, lying over each other like Scales, somewhat like the Flowers of Hops, from whence this Plant had the Title of Hop Clover. But there are two Sorts of this which grow naturally in England. The other, which is the fourth Sort, is a much smaller Plant than this, and has trailing Stalks. The Heads of Flowers are smaller, and the Flowers are of a deeper yellow Colour; these are not abiding Plants, so are by no Means proper to be sown, where the Ground is designed to continue in Pasture; but in such Places where one or two Crops only are taken, and the Land is ploughed again for Corn, it may do well enough when it is mixed with other Seeds, though the Cattle are not very fond of it green, unless when it is very young. The large Sort is the most profitable, but this is rarely to be had without a Mixture of the small Kind, and also of the smaller Melilot, which is commonly called None-such, or sometimes Black Seeds, for those who save the Seeds for Sale, are seldom curious enough to distinguish the Sorts; but where the Beauty of the Verdure is considered, there must not be any of the Seeds sown, because their yellow Heads of Flowers are very unsightly among the Grass; and if it is in Gardens where the Grass is constantly mowed, the Flowers of these Plants will come out near the Root in such Clusters, as to occasion large, unsightly yellow Patches; and as the Heads decay, they turn brown, and have a very disagreeable Appearance.

The 5th Sort grows naturally on chalky Lands in many Parts of England, and in some Countries, the Seed is sown after the same Manner as the common red Clover, especially on Chalky Ground; where it will thrive, and produce a better Crop than Clover. The Stalks of this are hairy, and grow erect to the Height of 2 Feet or more, and are garnished with trifoliate Leaves, standing on long Foot Stalks, whose Lobes are longer than those of the red Clover, and have no Marks of white; they are of a yellowish green Colour, and are covered with soft Hairs. The Flowers grow in oval Spikes at the End of the Branches; they are of a

pale Copper Colour, their Petals are long and tubulous; but the Brim is divided into 2 Lips as the other Sorts. It flowers and ripens its Seeds about the same Time as the common Clover.

This is known by the Title of Trefoil, in the Places where it is cultivated, but the Seedsmen sell the Hop Clover by that name, so they make no Distinction between this, the Hop Clover, and None-such, therefore, by which of these three Titles the Seeds are brought, they prove the same. This Sort of Trefoil is much cultivated in that Part of *Essex* which borders on *Cambridgeshire*.

The 6th Sort grows naturally in *Spain* and *Italy*; this has upright Stalks, near 2 Feet high, which are hairy, and garnished with trifoliate Leaves having roundish Lobes sawed at their Points. The Flowers are produced at the Top of the Stalk in long obtuse hairy Spikes; they are of a bright red Colour, so make a pretty Appearance during their Continuance. It is an annual Plant, so is not proper for sowing with Grass, otherwise it makes good Fodder.

The 7th Sort is an annual Plant which grows naturally in the South of *France* and *Italy*; it rises with a strong herbaceous Stalk, near 3 Feet high, which is smooth, and garnished with trifoliate Leaves, whose Lobes are 2 Inches and a Half long, and near a Quarter broad, standing on long Foot Stalks which are embraced by Stipulae or Sheaths their whole Length. The Flowers are produced at the Top of the Stalks in very long Spikes; they are of a beautiful red Colour, so make a fine Appearance. It flowers in *July*, and the Seeds ripen in Autumn.

The 8th Sort grows naturally in *Spain* and *Italy*; this rises with a slender stiff Stalk, near 2 Feet high, garnished with trifoliate Leaves, whose Lobes are very narrow like Grass, and are hairy. The Flowers are produced at the Top of the Stalks in oblong conical Spikes; the Indentures of their Empalements end in long bristly Hairs which are almost equal in Length; the Spikes are hairy, and the Flowers of a pale red Colour. It flowers and ripens its Seeds about the same Time as the former.

The 9th Sort is the common Haresfoot Trefoil, which grows naturally on dry gravelly Land in most Parts of *England*, and is a sure Indication of the Sterility of the Soil, for it is rarely seen on good Ground. This Plant is seldom eaten by Cattle, so is unfit for Pasture, and is only mentioned here because it is sometimes used in Medicine; it is an annual Plant whose Root decays soon after it has perfected Seeds.

The 10th Sort grows naturally on arable Land in many Parts of *England*; this has trailing Stalks which put out Roots at their Joints. The Leaves stand on long slender Foot Stalks; the Lobes are roundish, and sawed on their Edges; the Flowers are collected in roundish Heads, standing on slender Foot Stalks, which rise from the Wings of the Stalks; these have Bladder Empalements which terminate in 2 Teeth. When these lie on the Ground, their globular Heads, having a little Blush of red on their upper Side toward the Sun, and the other Part being white, have a great Resemblance of Strawberries, and from thence it was tiled Strawberry Trefoil.

These Sorts are frequently preserved in Gardens for Variety; they are easily propagated by Seeds, which

may be sown on an open Bed of Ground, either in Autumn or Spring. The Plants, which come up in Autumn, will grow much larger, and flower earlier in the Summer than those which are sown in the Spring, so from those good Seeds may be always obtained, whereas the other sometimes miscarry. When the Plants come up, they require no other Care than to keep them clean from Weeds, and thin them where too close.

The 11th Sort is the common Melilot used in Medicine; it grows naturally among the Corn in many Parts of England, particularly in Cambridgeshire in great Plenty, where it is a most troublesome Weed, for in reaping it is scarce possible to separate it from the Melilot, so that it is carried in with the Corn, and the Seeds of the Melilot being ripe about the same Time with the Corn, they are threshed out with it, and being heavy are difficult to separate from it, and when a few of the Seeds are ground with the Corn, it spoils the Flower; for the Bread, or whatever else is made with it, will have a strong Taste like Melilot Plaster.

The Roots of this Plant are strong and ligneous, from which Spring out several Stalks which rise from 2 to 4 Feet high, according to the Goodness of the Land. The Stalks branch out, and are garnished with trifoliate Leaves, having oval sawed Lobes of a deep green Colour. The Flowers are produced in long slender Spikes, which spring from the Wings of the Stalks; they are of a bright yellow, and shaped like the other Butterfly Flowers; these are succeeded by naked Seeds which ripen in August.

The 12th Sort grows naturally in Bohemia and Austria, but has been long cultivated in England as a medicinal Plant, though at present it is rarely used; it is annual. The Stalks are large, hollow, and channeled; they rise about a Foot high, and send out many Branches, garnished with trifoliate Leaves, whose Lobes are oval and slightly sawed on their Edges, standing on pretty long Foot Stalks. The Flowers are collected in oblong Spikes, which stand on very long Foot Stalks, springing from the Wings of the Stalks at every Joint the whole Length of the Stalk; they are of a pale blue Colour, and shaped like those of the common Melilot; these appear in June and July, and are succeeded by small yellow Seeds of a Kidney Shape, two or three being included in each short Pod; these ripen the Beginning of September. The whole Plant has a very strong Scent like that of Fenugreek, and perishes soon after the Seeds are ripe.

If the Seeds of these two Sorts are permitted to scatter, the Plants will rise without Care, and require no other Culture, but to keep them clean from Weeds, and thin them where they grow too close.

TRIGONELLA. Lin. Gen. Pl. 804. *Fœnum Græcum.* Tourn. Inst. R. H. 409. Tab. 230. Fenugreek.

The Characters are,

The Empalement of the Flower is Bell-shaped, of 1 Leaf cut at the Top into 5 almost equal Segments. The Flower is of the Butterfly Kind; the Standard is oval, obtuse and reflexed; the two Wings are oblong, reflexed, and spreading flat like the Standard, so as outwardly to appear like a regular Flower of three Petals; the Keel is very short, obtuse and occupies the Navel of the Flower. It has 10 short rising Stamina, 9 of which are joined,

and one stands separate, terminated by single Summits, and oval oblong Germen, supporting a single Style, crowned by a rising Stigma. The Germen afterward turns to an oblong oval Pod compressed, and close filled with Kidney-shaped Seeds.

The Species are,

1. **TRIGONELLA** *leguminibus sessilibus strictis erectiusculis subfalcatis acuminatis.* Hort. Cliff. 229. *Trigonella* with Sithe-shaped acute-pointed Pods which are close, erect, and sit close to the Stalks. *Fœnum Græcum sativum.* C. B. 348. Common or cultivated Fenugreek.

2. **TRIGONELLA** *leguminibus pedunculatis congestis erectis rectis parallelis linearibus.* Lin. Sp. Pl. 777. *Trigonella* with linear, erect, parallel Pods growing in Clusters and having Foot Stalks. *Fœnum Græcum sylvestre, siliquis plurimis longioribus.* Tourn. Inst. 409. Wild Fenugreek with many longer Pods.

3. **TRIGONELLA** *leguminibus sessilibus arcuatis confertis, caulibus procumbentibus.* *Trigonella* with arched Pods growing in Clusters and sit close to the Stalks, which trail on the Ground. *Fœnum Græcum sylvestre alterum polyceration.* C. B. P. 348. Another wild Fenugreek with many Pods.

4. **TRIGONELLA** *leguminibus pedunculatis congestis pendulis ovalibus compressis, caule diffuso, foliis subrotundis.* Hort. Cliff. 229. *Trigonella* with clustered, oval, compressed hanging Pods having Foot Stalks, diffused Stalks, and roundish Lobes. *Melilotus supina latifolia, siliqua lata membranacea compressa.* Amman. Rub. 151. Low broad leaved Melilot with broad, compressed, membranaceous Pods.

5. **TRIGONELLA** *leguminibus pedunculatis congestis pendulis linearibus rectis, foliis sub lanceolatis.* Lin. Sp. Pl. 776. *Trigonella* with linear strait Pods which hang down, and grow in Clusters on Foot Stalks, and Spear-shaped Lobes to the Leaves. *Melilotus supina angustifolia, medicæ folio, siliqua compressa.* Amman. Rub. 119. Low narrow-leaved Melilot with the Appearance of Medick, and a compressed Pod.

6. **TRIGONELLA** *leguminibus pedunculatis congestis declinatis subfalcatis compressis, pedunculo communi spinoso foliis longiore.* Lin. Sp. Pl. 777. *Trigonella* with Sickle-shaped, compressed, and clustered Pods growing on Foot Stalks, and a common spiny Foot Stalk longer than the Leaves. *Fœnum Græcum sylvestre polyceration Creticum majus.* Breyn. Cent. 97. Greater wild Fenugreek of Crete with many Pods.

The 1st Sort is the common Fenugreek, whose Seeds are used in Medicine. Where this Plant grows naturally is uncertain, but it is cultivated in the Fields, in the South of France, and in Germany, from whence great Quantities of the Seeds are annually imported for Use.

It is an annual Plant which rises with a hollow branching herbaceous Stalk, a Foot and a Half high, garnished with trifoliate Leaves placed alternately, whose Lobes are oblong, oval, indented on their Edges, and have broad furrowed Foot Stalks. The Flowers come out singly at each Joint from the Wings of the Stalk; they are white, of the Butterfly Kind, and sit very close to the Stalk; these are succeeded by long compressed Pods shaped somewhat like a broad Sword, ending in long Points, having a broad Membrane

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on one Edge, filled with square yellow Seeds indented one Side like a Kidney. The whole Plant has a very strong Odour.

This Plant has not as yet been cultivated in any Quantity for Use in *England*, as it has generally proved a very uncertain Crop, occasioned by the Inconstancy of the Weather here, for in cold wet Seasons the Plants are frequently killed before the Seeds ripen, and if any of them live long enough to perfect their Seeds, the Pods change of a dirty Colour, and the Seeds turn black and unfightly, when much Rain falls about the Time of their ripening; therefore the Seeds, which are imported from the Continent, are always preferred to those of our own Growth.

But as the Consumption of these Seeds is very great in *England*, there are some Persons who are inclinable to make fresh Trials to cultivate the Plants in *England*. and, as I have many Years cultivated this in small Quantities and have made Trials by sowing the Seeds at different Seasons, and after various Manners, by which I have acquired a Knowledge of its Culture, I shall here give such Directions for the Management of this Plant, as from Experience has been found to succeed best.

The Ground, in which this Plant thrives best, is a light Hazel Loam, not enriched with Dung; this should be kept clean from the Roots of Weeds, and well-ploughed twice and harrowed fine before the Seeds are sown. The best Time to sow the Seeds is in the Beginning of *September*; these should be sown in shallow Drills like Peas. The Rows should be two Feet asunder, and the Seeds must be scattered one Inch distant from each other in the Drills, for if the Plants are too close together in the Spring, they may be easily thinned with the Hoe, when the Ground is cleaned. When the Seeds are sown at the before mentioned Time, the Plants will appear in three Weeks or a Month after, and if the Weeds appear at the same Time, the Ground should be hoed over as soon as possible in dry Weather, to destroy the Weeds, and when the Plants are grown an Inch high, the Earth should be drawn up to their Stems, in the same Manner as is practised for Peas. This will secure their Stems from being injured by sharp cutting Winds, and if a Ridge of Earth is drawn up on the North or East Side of each Row, it will protect the Plants from the pinching Winds which blow from both these Quarters, for although this Plant will not be in any Danger from the Frost, in the ordinary Winters, yet in very severe Frosts they are sometimes killed; but, as this Plant will live in any Situation, where Peas stand through the Winter, there will be no greater Hazard of the one Crop than the other.

In the Spring of the Year the Ground must be hoed again in dry Weather to kill the Weeds, and the Plants should be again earthed up in like Manner as Peas, with whose Culture this Plant will thrive, but there must be great Care taken to keep the Ground as clean from Weeds as possible, for if they are permitted to grow, they will soon advance above the Plants, and greatly weaken them, and when their Pods begin to form, they cannot be too much exposed to the Sun and Air, whereby they will be less liable to suffer from Moisture.

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When the Seeds are sown in Autumn, the Plants will grow much stronger, and have many more side Branches than those which come up in the Spring, so will produce a much greater Crop of Seeds, and these will produce their Flowers five or six Weeks earlier, so will have a better Season to ripen, but in order to have them better ripened, the Top of the Plants should be cut off with Garden Shears about the Middle of *June*, by which Time the Pods will be formed on the lower Part of the Stalks, which will be greatly forwarded by topping the Stalks as is commonly practised for Garden Beans, for where the Plants are suffered to extend in Length, the lower Pods often miscarry, or are less nourished, and those on the Top of the Stalks are late before they ripen, so where the Topping of the Plants is omitted, the Pods at Bottom will open and cast out their Seeds, before those above will be ripe, therefore to preserve the first and cut off the other, will be found the best Method, for by so doing the Pods will ripen equally, and much earlier in the Season.

If the Summer proves warm, the Seeds will ripen in *August*, and the Plants should then be cut off, and laid to dry for five or six Days, in which Time they should be turned two or three Times, that the Pods may dry equally; then the Seeds may be either threshed out in the Field, or the Haulm may be housed in a Barn, to be threshed in a more convenient Time.

The 2d Sort grows naturally in *Spain* and *Sicily*. The Stalks of this are slender, and rise near a Foot high, sending out 2 or 3 slender Branches, garnished with trifoliate Leaves, whose Lobes are Wedge-shaped, and sawed at their Ends where they are indented; these stand on long slender Foot Stalks. The Flowers are produced in Clusters at the End of the Branches, on short Foot Stalks which stand erect; they are small, of a pale Colour, and are succeeded by narrow Pods standing parallel and erect. This is an annual Plant which flowers in *July*: The Seeds ripen the End of *August*, and the Plants decay soon after.

The 3d Sort grows naturally in *Spain* and *Italy*; this is also an annual Plant whose Root decays soon after the Seeds are ripe. The Stalks trail upon the Ground, and extend a Foot and a Half in Length, sending out several side Branches, these are garnished with small trifoliate Leaves, whose Lobes are Wedge-shaped, and sawed at their Points. The Flowers are produced in Clusters at the Wings of the Stalk; they are small, of a pale yellow Colour, and sit very close to the Stalks; these are succeeded by short hooked Pods, which sit close to the Stalks in Clusters, spreading out every Way. It flowers in *July*, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in *Siberia*. The Root of this is biennial; the Stalks trail on the Ground, and extend a Foot in Length, sending out many Side Branches; these are garnished with trifoliate Leaves, having roundish Lobes, sawed on their Edges. The Flowers come out from the Wings of the Stalks on Foot Stalks, growing in Clusters; they are small, of a yellowish white Colour, and are succeeded by oval compressed Pods containing 2 Seeds in each. It flowers in *June*, and the Seeds ripen in *September*.

The 5th Sort grows naturally in *Siberia*; this is also

also a biennial Plant whose Roots decay soon after the Seeds are ripe. The Stalks of this are very slender, and trail on the Ground; they extend a Foot and a Half in Length, and divide into several Branches. The Leaves are trifoliate; the Lobes are Wedge-shaped, indented at the Point, and sawed; they are narrower than either of the former. The Flowers are produced in Clusters, on slender Foot Stalks, which spring from the Wings of the Stalk; they are small, and of a bright yellow Colour; these are succeeded by narrow erect Pods, which contain 3 or 4 small Seeds. This flowers and perfects its Seeds about the same Time as the former. The Seeds of both these Plants were sent me by the late Dr. Amman, Professor of Botany at Petersburg.

The 6th Sort grows naturally in Crete; this is an annual Plant whose Stalks are slender, herbaceous, and declining; they extend a Foot in Length, and divide into many Branches, garnished with trifoliate Leaves whose Lobes are small, Heart-shaped, and sawed at their Tops, standing on short Foot Stalks. The Flowers are small, of a pale yellow Colour, and stand on short Foot Stalks, which spring from the Wings of the Stalk; these are succeeded by Sickle-shaped compressed Pods which decline, and contain several oblong small Seeds. The Foot Stalks, which sustain the Pods, have a Spine springing from their Base, which is longer than the Foot Stalks of the Leaves.

These Plants are frequently cultivated in Gardens for Variety, but I do not know any Use is made of either of the Sorts except the first. The Seeds of these should be sown in the Places, where the Plants are designed to stand, for they will not bear transplanting. If they are sown in Autumn, as before directed for the first Sort, the Plants will come earlier to flower, and good Seeds may be obtained with more Certainty than from the Spring Plants. All the Culture these require is to thin them where they stand too close, and keep them clean from Weeds. A few Plants of each Sort in a Garden will be sufficient as they have no great Beauty.

The Seeds of the first Sort are very rarely used for internal Medicines, but are much used in Fomentations, Bathings, and Cataplasms, and also in emollient Glysters, being ripening, dissolving, and anodyne, and good for all Kinds of Tumours and Swellings, to which Purpose the Farina or Powder is very effectual. Farriers and Grooms make much Use of it in Drinks for Horses, but these Seeds are too hard to be pounded in a Mortar, so they should be ground in a Mill.

TRILLIUM. Lin. Gen. Pl. 412. *Solanum*. C. B. P. American Herb Paris.

The Characters are,

The Flower has a three-leaved spreading Empalement which is permanent, and 3 oval Petals, which are very little larger than the Empalement; it has 6 Awl-shaped Stamina shorter than the Petals, erect, and terminated by oblong Summits the Length of the Stamina, and a roundish Germen, with 3 slender Styles which are recurved, crowned by single Stigmas. The Germen afterward becomes a roundish Berry with 3 Cells filled with roundish Seeds.

The Species are,

1. TRILLIUM flore pedunculato cernuo. Lin. Sp. Pl. 339. Trillium with a nodding Flower growing on a Foot Stalk. *Solanum Triphyllum*, flore hexapetalo carneo.

Catesb. Car. Vol. 1. p. 43. Three-leaved Nightshade with a Flesh-coloured Flower having six Petals.

2. TRILLIUM flore pedunculato erecto. Lin. Sp. Pl. 340. Trillium with a Flower growing erect on a Foot Stalk. *Solanum triphyllum Canadense*. Cornut. 166. Three-leaved Canada Nightshade.

3. TRILLIUM flore sessili erecto Lin Sp. Pl. 340. Trillium with an erect Flower having no Foot Stalk. *Solanum triphyllum flore hexapetalo tribus petalis purpureis, cæteris viridibus reflexis* Catesb. Car. 1. p. 50. Three-leaved American Nightshade with a Flower of 6 Petals, 3 of which are purple-coloured, and the other green and reflexed.

These Plants grow naturally in the Woods in many Parts of North America; the first was sent me from Philadelphia by Dr. Bensel, who found it growing in Plenty there. The Root of this Plant is tuberous, sending out many Fibres; the Stalk is single, naked, and rises 5 or 6 Inches high, with 3 oval Leaves placed at the Top on short Foot Stalks, which spread out in a Triangle; these are 2 Inches long, and an Inch and a Half broad, smooth, and of a deep green Colour. From the Center of the Foot Stalks of the three Leaves comes out one Flower on a short Foot Stalk which nods downward; this has a three-leaved green Empalement which spreads open, and within are 3 Petals about the Size of the Empalement; they are of a whitish green on their Outside, and purple within, having 6 Stamina in the Center, surrounding the Style which have oblong Summits. The Flowers of this appear in April, and are succeeded by roundish succulent Berries, having 3 Cells filled with roundish Seeds, which ripen in June.

The 2d Sort has a taller Stalk than the first. The 3 Leaves are placed at a Distance from the Flower, which stands on a long Foot Stalk, and is erect; the Petals of the Flower are larger, and end with sharp Points.

The 3d Sort grows in shady Thickets in Carolina. The Stalk of this is purple; the three Leaves grow at the Top like the first, but they are much longer, and end in acute Points; the Petals of the Flowers are long, narrow, and stand erect.

These Plants are propagated by Seeds, which should be sown on a shady Border soon after they are ripe, and then the young Plants will come up the next Spring, but if the Seeds are sown in the Spring, they will remain in the Ground a Year. When the Plants come up, they must be kept clean from Weeds, and in Autumn, after their Leaves decay, the Roots may be transplanted to a moist shady Place, where they are to remain.

TRIOSTEUM. Lin. Gen. Pl. 211. *Triosteospermum*. Dillen. Hort. Elth. Dr. Tinkar's Weed, or false Ipecacuana.

The Characters are,

The Flower has a permanent Empalement of 1 Leaf cut into 5 Segments which are the Length of the Petal; it has a tubulous Flower of one Petal, with a short Brim cut into 5 Parts which stand erect, and 3 slender Stamina, the Length of the Tube, terminated by oblong Summits, with a roundish Germen, supporting a cylindrical Style, crowned by a thick Stigma. The Germen afterward becomes an oval Berry with 3 Cells, each including 1 hard, three-cornered, obtuse Seed.

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The Species are,

1. *TRIOSTEUM floribus verticillatis sessilibus. Lin. Sp. Pl. 176.* *Triosteum* with Flowers growing in Whorls, and sitting close to the Stalks. *Triosteospermum latiore folio, flore rutilo. Hort. Elth.* Broad-leaved *Triosteospermum* with a reddish Flower, commonly called Dr. Tinkar's Weed, or false Ipecacuana.

2. *TRIOSTEUM floribus oppositis pedunculatis. Lin. Sp. Pl. 175.* *Triosteum* with Flowers growing opposite, and having Foot Stalks. *Periclymenum herbaceum rectum Virginianum. Pluk. Alm. 287.* Upright herbaceous Virginia Honeyfuckle.

The 1st Sort grows naturally in the Woods in most Parts of North America; this has a Root composed of thick fleshy Fibres which are contorted and rough, from which spring several strong herbaceous Stalks, rising a Foot and a Half high, garnished at each Joint by 2 oblong broad Leaves sitting close to the Stalk. From the Bosoms of these come out the Flowers in Whorls sitting very close to the Stalks; these have Empalements which are cut into 5 Segments. The Flowers are small, tubulous, and cut slightly at the Brim into 5 obtuse Segments; they are of a dark red Colour inclining to purple; these appear the Beginning of June, and are succeeded by roundish Berries which turn yellow when ripe; they have 3 Cells in each of which is contained 1 hard Seed. The Root is perennial, but the Stalks decay every Autumn.

The 2d Sort differs from the first in its Leaves being longer and narrower. The Flowers stand single on short Foot Stalks and there are but two at each Joint, whereas the other has many growing in Whorls round the Stalks, but the Roots of both are indifferently used in America by the Title of Dr. Tinkar's Weed.

Both these Plants are Natives of New England, Virginia, and some other northern Parts of America, where their Roots have been frequently used as an Emetick, and are commonly called Ipecacuana. One of the first Persons who brought their Roots into Use was Dr. Tinkar, from whence many of the Inhabitants have called them by the Name of Dr. Tinkar's Weed. The Leaves of the first Sort greatly resemble those of the true Ipecacuana, but the Roots are of a different Form; but so far as I can judge by the imperfect Fruit of a Specimen in my Collection of the true Ipecacuana, as also by the Figure and Description given by Piso in his History of Brasil, it seems to belong to this Genus.

The 1st grows on low marshy Grounds, near Boston in New England, very plentifully, where the Roots are taken up every Year, and are continued in Use among the Inhabitants of Boston.

This Plant is preserved in several curious Gardens in England, and is hardy enough to thrive in the open Air, but it should be planted on a moist light Soil; for if it is on a dry Ground, there must be care taken to water the Plants constantly in dry weather, otherwise they will not thrive. It may be propagated by Seeds, which should be sown on a Border of light Earth, where the Morning Sun only comes on it; but if these Seeds are sown in the Spring, they will remain in the Ground a whole Year before the Plants will come up, so that during this Time the Border must be constantly kept clean from Weeds, and the following Spring, when the Plants

appear, they should be duly watered in dry Weather, which will greatly promote the Growth of the Plants; but if the Seeds are sown in Autumn, the Plants will come up the following Spring. They must be constantly kept clean from Weeds, which, if permitted to grow amongst them, will soon overbear the Plants while they are young, and either quite destroy them, or so much weaken them, that they will not recover in a long time.

The Plants may remain in this Seed Border until the Michaelmas following, when they should be carefully taken up, and transplanted where they are designed to remain. Some of them should be planted in Pots, that they may be sheltered in Winter; lest those which are in the full Ground should be destroyed by severe Frost.

This Plant may be also propagated by parting the Roots. The best Season for this Work is in the Spring, just before the Plants begin to shoot, which is commonly about the Middle or latter End of March; but in doing this, the Roots must not be parted too small; for that will prevent their flowering strong.

These Plants perfect their Seeds in this Country every Year, which, if sown in Autumn, as soon as they are ripe, the Plants will come up the following Spring, by which means a whole Year will be saved. These seedling Plants will not flower until the third Year, and then they are seldom so strong as the older Plants.

TRIPETALOUS FLOWERS are such as consist of three Leaves, which are called Petals, to distinguish them from the Leaves of Plants.

TRIPOLIUM See Asler.

TRITICUM. Tourn. Inst. R. H. 512. Tab. 292, 293. Lin. Gen. Pl. Wheat; in French, Froment.

The Characters are,

It has an oval chaffy Empalement with 2 Valves, which inclose 2 or 3 Flowers. The Petals have a double Valve as large as the Empalement; the outer Valve is bellied and acute-pointed; the inner is plain. The Flowers have 3 Hair like Stamina terminated by oblong forked Summits, and a Top-shaped Germen, supporting 2 hairy reflexed Styles, crowned by feathered Stigmas. The Germen afterwards becomes an oblong oval Seed, obtuse at both Ends, convex on one Side, and channelled on the other, wrapped up in the Petal of the Flower.

The Species are,

1. *TRITICUM glumis ventricosus levidus imbricatus submuticis. Hort. Ups. 21.* Wheat without Beards, and having smooth, bellied, imbricated Husks. *Triticum bybernum aristis carens. C. B. P. 21.* Winter Wheat without Awns, or common Wheat.

2. *TRITICUM glumis ventricosus glabris imbricatis aristatis Hort. Ups. 21.* Bearded Wheat with smooth, imbricated bellied Husks. *Triticum aestivum C. B. P. 21.* Summer or Spring Wheat.

3. *TRITICUM glumis ventricosus villosis imbricatis obtusis. Hort. Ups. 21.* Wheat with hairy, bellied, imbricated, obtuse Husks. *Triticum spica villosa quadrata, Acvioris & turgidioris. Mor. Hist. 3. p. 176.* Wheat with four-cornered, short, hairy, turgid Spikes, commonly called gray Pollard or Duckbill Wheat.

4. *TRITICUM glumis ventricosus villosis imbricatis, spicis oblongis pyramidalis.* Wheat with hairy, bellied, imbricated Husks, and oblong pyramidal Spikes. *Triticum spica villosa quadrata longiore, aristis munitum. Mor. Hist.*

Hist. 3. p. 176. Wheat with longer, four-rowed, hairy Spikes armed Beards, commonly called Cone Wheat.

There are some other Varieties of Wheat, which the Farmers in different Parts of *England* distinguish by different Titles, but they are only feminal Variations, which have risen from Culture. Some of these differ in the Colour of their Chaff, and others in the Form of their Spikes, but as they are subject to vary, we shall not enumerate them as different Species. These are, The red Wheat without Awns, the red-eared, bearded Wheat, *Poland* Wheat, many-eared Wheat, and naked Barley. The four Sorts above enumerated I have sown several Years, and have always found them constant without Variation.

Where Wheat grows naturally is very hard to determine at present, but it is generally supposed that *Africa* is the Country, because in the earliest Accounts we have of it, there is Mention of its being transported from thence to other Countries, and *Sicily* was the first Country in *Europe* where this Grain was cultivated; but although the Country of its natural Growth is in a very warm Climate, it is found to bear the Inclemency of our rough Climate very well, and in more northern Countries, where the Summers are long enough to ripen the Grain, it is found to succeed.

The 1st Sort is the common Wheat which is sown in most Parts of *England*, and is so well known as to need no Description. The Spikes or Ears of this are long; the Grains are ranged in four Rows, and lie over each other like the Scales of Fish; the Chaff is smooth, belied, and is not terminated by Awns or Beards.

The 2d Sort is called Summer or Spring Wheat; this will ripen much earlier than the other, so has often been sown in the Spring of the Year, at the same Time with Oats; but if the Season proves wet, it is very subject to grow tall, and have very thin Grains which has discouraged People from sowing it at that Season, so that unless from the Severity of the Winter, or some other Accident, the Winter Corn is injured, the Practice of sowing Wheat in the Spring is rarely used.

The 3d Sort is called in some Places gray Wheat, in others Duckbill Wheat and gray pollard, but in *Suffex* it is generally known by the Title of Fullers Wheat; this Sort grows very tall, and if it is sown too thick, is very apt to lodge with Rain and Wind, for the Ears are large and heavy; they nod on one Side as the Grain increases in Weight. The Awns are long; the Chaff hairy which detains the Moisture, all which help to lodge it, for which Reason many People do not choose to cultivate this Sort; but where the Roots are at a proper Distance from each other, they will put out many Stalks from each, and the Stalks will be stronger, and support themselves better, and the Grain produces more Flour in Proportion than any of the other Sorts. The Awns of this Sort always drop off when the Grain is full grown.

The 4th Sort is more cultivated in *Oxfordshire* and *Berkshire* than in any other Part of *England*. The Ears of this Sort are formed like a Cone, ending with a slender Point, from whence it had the Title of Cone Wheat. Of this there are the white and red, which I believe are only Varieties, for I have generally seen them mixed in the Field. The Awns of this are long and rough, so the Farmers say it guards the Grain

from Birds, which has been a Recommendation to sow it, especially near Inclosures, where there is Shelter for Birds. Mr. *Tull* prefers this Sort for sowing in Drills, but I have seen the third Sort answer much better in the Horse-hoeing Husbandry.

The Season for sowing Wheat is Autumn, and always when the Ground is moist. In the Downs of *Hampshire*, *Wiltshire*, and *Dorsetshire*, the Farmers begin sowing their Wheat in *August*, if there happens Rain, so that when they are in their Harvest, if the Weather stops them, they employ their People in sowing, for if the Corn is not forward in Autumn, so as to cover the Ground before Winter, it seldom succeeds well on those dry Lands, especially if the Spring should prove dry; but in the low strong Lands, if they get their Wheat into the Ground by the Middle of *November*, the Farmers think they are in good Season; but sometimes it so happens, from the Badness of the Season, that in many Places the Wheat is not sown till *Christmas* or after, but this late-sown Wheat is subject to run too much to Straw, especially if the Spring should prove moist.

The usual Allowance of Seed Wheat to one Acre of Land, is 3 Bushels, but from repeated Experiments, it has been found, that half that Quantity is sufficient; therefore, if the Farmers have Regard to their own Interest, they should save this Expence of Seed, which amounts to a considerable Article in large Farms, especially when it is to be purchased, which most of the skilful Farmers do, at least every other Year, by Way of Change; for they find that the Seeds continued long upon the same Land will not succeed so well, as when they procure a Change of Seeds from a distant Country. And the same is practised by the Husbandmen of the *Low-Countries*, who commonly procure fresh Seeds from *Sicily* every second or third Year; which they find succeed better with them, than the Seeds of their own Country. In the Choice of the Seeds, particular Regard should be had to the Land upon which it grew, for if it is light Land, the Wheat which grew on strong Land is the best, and so *vice versa*.

There have been some Persons in *England* curious enough to procure their Seed Wheat from *Sicily* which has succeeded very well, but the Grain of this has proved too hard for our *English* Mills to grind, which has occasioned their neglecting to procure their Seeds from thence; nor do I think there can be much Advantage in procuring the Seeds from Abroad, since the Lands of *England* are so various, as to afford as much Change of Seeds as will be necessary. And the less we purchase from Abroad, the greater will be the Saving to the Publick, so that it should be the Business of skilful Farmers to want as few Seeds as possible, since, by Exchange with each other, they may so contrive, as not to part with ready Money for any Seeds.

The Land which is usually allotted for Wheat, is laid fallow the Summer before the Corn is sown; during which Time it is ploughed 2 or 3 Times to bring it into a Tilth; and the oftener and better the Ground is ploughed, and the more it is laboured with Harrows between each Ploughing to break and divide the Clods, the better will be the Crop, and the fewer Weeds will be produced. But in this Article most of the Farmers

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are deficient; for after they have given their Lands one Ploughing, they frequently leave it to produce Weeds, which sometimes are permitted to stand until they shed their Seeds, whereby the Ground will be plentifully stocked with Weeds; and as an Excuse for this, they say that these Weeds will supply their Sheep with some Feed, and the Dung of the Sheep will mend their Land; but this is a very bad Piece of Husbandry; for the Weeds will draw from the Land more than the Dung of the Sheep will supply; so that it is undoubtedly the best Method to keep the Ground as clean from Weeds as possible, and to stir it often to separate and break the Clods, and render the Land fine; and where the Land can enjoy a Winter's Fallow, it will be of much greater Service to it, than the Summer; and by thus labouring the Land, it will be of equal Service to it as a Dressing of Dung. Therefore if the Farmers could be prevailed on to alter their Method of Husbandry, they would find their Advantage in it; for the Expence of Dressing in some Countries is so great, as to take away the whole Profit of the Crop.

There is also a very absurd Method in common Practice with the Farmers, which is the carrying their Dressing, and spreading it on the Land in the Summer; where it lies exposed till the Sun has dried out all the Goodness of it, before it is ploughed into the Ground; so that the Dressing is of little Value; therefore the Dung should never be laid on the Land faster than it can be ploughed in; for one Load of Dung so managed, is better than three in the usual Method.

As Wheat remains a longer Time on the Ground than most other Sorts of Corn, it requires a greater Stock of Nourishment, to lengthen and fill the Ears; therefore, if the Dressing is exhausted in Winter, the Corn will have but short Ears, and those but lean, nor will the Grain afford much Flour; so that it frequently happens, that a light Dressing of Soot in the Spring, at the Time the Wheat is beginning to stalk, proves of greater Service to the Crop, than a Dressing of Dung laid on the Land before it is ploughed, especially if the Dung is not very good. Deep ploughing (where the Staple of the Ground is deep enough to admit of it) will also be of great Service to the Corn; for the small Fibres of the Roots, which are the Mouths that supply the Nourishment, extend themselves very deep into the Ground. I have traced many of them upward of 3 Feet, and believe they spread much farther where the Ground is light; therefore it is of great Advantage to the Crop to have the Ground stirred and loosened to a proper Depth; for by so doing the Roots will find a supply of Pasture for the Nourishment and Augmentation of the Ears, at the Time they are forming, when it is most required; for if the Ground is ploughed shallow, the Roots will have extended themselves to that Depth by the Spring, so that when the Nourishment is wanted to supply the Stalks, the Roots are stunted by the Hardness of the Soil, which they cannot penetrate; when this is the Case, the Colour of the Blade is frequently seen to change in *April*, and seldom recovers its Verdure again, and when this happens, the Stalks are always weakened in Proportion to the Decay of the Blade; for it is well known from long Experience that the Leaves or Blade of Corn, are ne-

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cessary to draw in Nourishment from the Air and Dews for the Increase of the Stalk and Ear; but in order to ascertain this, I have made Trial of it, by cutting off the Leaves of some Roots of Wheat alternately, early in the Spring, and have constantly found the Stalks upon those Roots much smaller, the Ears shorter, and the Grain thinner than those of the intermediate Roots, whose Blades were not cut. This shews the Absurdity of that Practice of feeding Sheep upon Corn in the Winter and Spring. I have frequently seen in some Gardens, Plants divested of their lower Leaves which ignorant Persons have supposed to draw away the Nourishment from the Head; but wherever this has been practised, I have always seen the Plants have been greatly weakened by it; so that until those Leaves decay naturally, they should never be taken off.

Of late Years, many Composts have been advertised for steeping the Seeds of Corn, in order to improve their Growth; some of these have been sold at a dear Rate; but as so great Success was assured by the Inventors, to those who should make use of them, there were Numbers of Persons who made the Trial; but so far as I have been able to get Information of their Experiments, they did not succeed so well as to encourage the Use of these Compositions; and from several Trials which I made myself with great Care, I always found, that the Wheat which had been steeped in these Compositions came up sooner, and grew much ranker in the Winter, than that which had not been steeped; but in the Spring the unsteeped Wheat had a greater Number of Stalks to each Plant, and the Ears were better fed, than those which had been steeped; therefore these Sorts of Composts have been found of no real Use to the Crop.

My Experiments were made in the following Manner. The Wheat was sown in Drills, on the same Spot of Ground; the Seeds which had been steeped were sown in alternate Rows; and the intermediate Rows were sown with unsteeped Corn. The Rows were a Foot and a Half asunder, and the Grains were all taken out of one Measure, and sown as equally as possible: The steeped Corn appeared above Ground three Days before the other, and continued to grow faster than the unsteeped Corn, during the Winter, but in the Spring, the Blade of the steeped Corn changed its Colour, and their Points became of a brown Colour, when I gave a light Dressing to one of the Rows, which soon recovered its Verdure, and caused it to be the strongest Row of the Whole; but the others which had not this Dressing produced weaker Stalks and Ears, than that which was not steeped.

I have before observed, that in general the Farmers sow more than double the Quantity of Corn on their Lands than is necessary; therefore there is a great Waste of Grain, which in scarce Years, amounts to a considerable Sum in large Farms, and to a whole Country, it is an Object worthy the Attention of the Publick; but I fear whatever may be said to prevent this, will have but little Weight with the Practitioners of Agriculture; who are so fond of old Customs, as rarely to be prevailed upon to alter them, though they are extremely absurd. But if these People could be prevailed on to make the Trial with Care, they must be soon convinced of their Error; for if they will but examine a Field of Corn sown

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in the common Way, they will find but few Roots which have more than 2 or 3 Stalks unless by Chance, where there may be some few Roots which have Room to spread, upon which there may be 6, 8, or 10 Stalks, and frequently many more; but I have seen a Field of Wheat which had not a greater Allowance than one Bushel of Corn to an Acre, so that the Roots had Room to spread, I have observed the Roots produced from 6 to 12 or 14 Stalks, which were strong and had long, well-nourished Ears, and the Produce was much greater than in any of those Fields in the Neighbourhood, which were sown with the common Allowance. And if the Land is good, and the Roots stand at a proper Distance from each other, there will be few Roots which will not produce as many Stalks as I have here mentioned, and the Ears will be better nourished.

But if the Land is not covered with the Blades of Corn by the Spring, the Farmers think they shall have no Crop, whereas, if they would have Patience to wait till the Roots put out their Stems, they would soon be convinced of the contrary; especially if they could be prevailed on to draw a weighty Roller over the Wheat in *March*, which will cause it to spread, and by settling the loose Ground to the Roots, the drying Winds in the Spring would be prevented from penetrating to their Fibres, so that the Roots will produce the more Stalks; but before this Operation, it will be proper to have the Corn cleaned from Weeds, for if these are permitted to grow, they will draw away much Nourishment from the Corn; and if, at this Season, the Land is made clean from Weeds, the Corn will soon after spread, and cover the Ground, whereby the Growth of Weeds will be greatly lessened.

There is not any Part of Husbandry which requires the Farmer's Attention more, than that of keeping his Land clean from Weeds; and yet there are few who trouble themselves about it, or who understand the proper Method of doing it; few of them know those Weeds which are annual, so as to distinguish them from those which are perennial; and without this Knowledge it will be much more difficult for a Person to clean his Land, let his Industry be ever so great, for annual Weeds may be soon destroyed, if taken in Time; whereas, if they are neglected, their Seeds will soon ripen and scatter; after which it will require three Times the Labour and Expence to get rid of them, as would have been sufficient at the Beginning; and then the Crop would have had no bad Neighbours to rob it of its Nourishment. The common Method now practised is a very absurd one; for the Weeds are left to grow till the Wheat is beginning to ear, and the Weeds are in flower; so the Ground being covered by the Corn, all the low Weeds are hid, and these are left to ripen, and scatter their Seeds; the tall Weeds only are taken out, and if the People employed are not careful, many of these will escape them, as they will be so intermixed with the Stalks of Wheat, as not to appear, unless diligently sought after. By this Method the Weeds of tall Growth are permitted to stand, and rob the Corn of its Nourishment, during the principal Time of its Growth, and the humble Weeds are never destroyed; and by going amongst the Stalks when they are tall, great Numbers of them are broken and trod under the Work-peoples

Feet; yet however obvious this is, to every Farmer, none of them have thought of altering this Practice. I would therefore recommend a Method which is now in common Practice among the Kitchen Gardeners, which has been found of great Benefit to their Crops, and has also been a great Saving to them in the Expence of Weeding; and this is making use of the small Kind of Hoes for cleaning the Wheat early in the Spring, before the Ground is covered with the Blades of Corn. With this Instrument, all the low as well as the tall Weeds will be cut up, and if it is performed in dry Weather, the Weeds being then small will soon die. Where the Ground happens to be very full of Weeds, it may be necessary to go over it a second Time, at about a Fortnight after the first, to cut up any Weeds which may have before escaped. By laying the Ground clean at this Time, the Corn will not be robbed of its Nourishment; and there will not be Time for the Weeds to grow so as to prejudice it much after, for the Ground will be so much shaded by the Corn, as to keep down the Weeds, so that they cannot have Time to ripen their Seeds before Harvest.

If, at the Time of this Operation, the Roots of Corn are cut up where they are too close, it will be found of great Service to the other; but this, I fear, few of the old Farmers will ever agree with me in; though what I mention is not from Theory but Experiments, which have been repeated with great Care; and where it was practised the Produce of twenty Rods of Ground, was much greater both in Weight and Measure, than the same Quantity of Ground in the best Part of the Field, where this was not practised, and the Stalks stood upright, when a great Part of the Corn in the same Field was lodged.

I have often observed in those Fields where Foot Paths are made through Corn Fields, that by the Side of those Paths where the Corn is thin, and has been trodden down in the Winter and Spring, that the Stalks have stood erect, when most of the Corn in the same Field has been laid flat on the Ground, which was owing to the Stalks being so much stronger from their having more Room; the other being drawn up tall and slender by being so close together. There is also another great Advantage in keeping Corn clean from Weeds, and giving it Room to spread, which is, that the Corn is not so liable to take the Smut, as when it is full of Weeds, and the Roots too much crowded, as I have frequently observed; so that Cleannefs and free Air is as essential to the well doing and Growth of Vegetables, as Animals; and the changing the Seed annually is also as necessary, as the Change of Air is to all Sorts of Animals; for where this has been carefully practised, there has rarely happened any smutty Corn in the Field.

Bringing of the Seed Wheat is what the Farmers generally practise to prevent the Smut; which in most Years answers very well; but there is nothing which contributes more to this, than keeping the Plants in good Health, which is better effected by the Method before proposed; for by stirring the Ground with the Hoe between the Roots of Corn in the Spring, they will be better supplied with Nourishment; for in strong Lands, where the Water may have lain in the Winter,

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the Surface of the Ground will bind so hard on the first dry Weather, as to stint the Corn, and frequently cause it to change Colour. When this happens, the Roots seldom put out many Stalks; and those which are put out, are weak; but where the Surface of the Ground can be stirred to loosen the Parts, the Corn will soon recover its Colour and Strength, and cover the Land with Shoots.

What has been here directed, must be understood to relate to Wheat sown in Broad-cast, which is the usual Method practised by Farmers in every Part of *England*; for the Horse hoeing Husbandry which was practised by Mr. *Tull*, has been almost universally rejected by the Farmers in every Country, it being so opposite to their accustomed Practice, that they cannot be prevailed upon to make Trial of it; and indeed, by the Absurdity of the Author in a few Particulars, he has discouraged many from engaging in it, who would have practised it; but upon finding Mr. *Tull* positively asserting, that the same Land would nourish the same Species of Plants without changing the Crops for ever, and this without Manure, which being contrary to all Experience, led them to believe his other Principles had no better Foundation. And he practised this Method of sowing the same Species upon the same Ground, till his Crops failed and were much worse than those of his Neighbours who continued their old Method of Husbandry, and hereby his Horse hoeing Husbandry was ridiculed by them, and laid aside by Gentlemen who were engaging in it. But notwithstanding those and some other Particulars which have been advanced by Mr. *Tull*, yet it is much to be wished that this new Husbandry might be universally practised; for some few Persons who have made sufficient Trial of it, have found their Crops answer much better, than in the common or old Method of Husbandry; and the *French* who have learned it from Mr. *Tull*'s Book, are engaging in the Practice of it with greater Ardour, than those of our own Country; and although they had not the proper Instruments of Agriculture for the Performance, and meet with as strong Opposition from the Persons employed to execute the Business, as in *England*, yet the Gentlemen seem determined to persist in the Practice of it; though as yet few of their Experiments have had the Success they hoped for; partly from the Awkwardness of their Labourers, and partly from their Averseness to practise this Husbandry; and also from their being made in Lands not well conditioned; but yet their Produce has been equal to that of the old Husbandry, and they say that if the Produce of the Land in the new Method of Husbandry, does not exceed that in the old Way, yet by saving seven Parts from eight of the Seed Corn, it is a great Affair to a whole Country, especially in Times of Scarcity.

As Mr. *Tull* has given full Directions for the Practice of this Husbandry, I shall refer the Reader to his Book for Instruction, and shall only mention two or three late Experiments which have been made in his Method, whereby the Utility of it will more fully appear.

The first was in a Field of Wheat, which was sown partly in Broad-cast in the common Method, and partly according to *Tull*'s Method; the Spots thus sown, were not regular in Lands, but interspersed indifferently in many

Directions. Those Parts of the Field in *Tull*'s Method, were in Rows at two Feet Distance, and stood thin in the Rows. The Roots of the Wheat in these Spots had from 10 to 30 Stalks on a Root, and continued upright till it was reaped; whereas few of the Roots in the common Method, had more than 2 or 3 Stalks, and these were most of them lodged before Harvest; so that upon Trial of the Grain when threshed, there was near a third Part more in Weight and Measure, than from the same Extent of Ground, taken in the best Part of the Field sown in the common Way.

Another Trial was made in sowing the Corn in Rows at different Distances, with some sown in two Parts of the Ground Broad-cast. The Event was that all which was sown Broad-cast in the usual Way was lodged, as was also most of that where the Rows were 6 or 9 Inches asunder; those which stood a Foot Distance escaped better, but the Rows two Feet asunder were the best, and the Produce much greater, than any of the other; which plainly shews the Absurdity of that Practice, in sowing a great Quantity of Seeds, to have a better Produce, which is the Opinion of most of the old Farmers; and it was formerly the prevailing Opinion among Gardeners, who allowed near 8 Times the Quantity of Seeds for the same Space of Ground, as is now usually sown, and these Crops are greatly superior to any of those.

The Produce of an Acre of Wheat is various, according to the Goodness of the Soil. In some of the shallow, chalky, down Lands, where there have been near four Bushels of Corn sown; I have known the Produce not more than double of the Seed; but when this is the Case, the Farmer had much better let his Land lie waste, since the Produce will not defray the Expence; so that more than the Rent of the Land is lost: And although these Sorts of Crops are frequently seen on such Land, yet such is the Passion for ploughing among the Husbandmen at present, that if they were not restrained by their Landlords, they would introduce the Plough into every Field, notwithstanding they are sure to lose by it.

But although the Produce of these poor Downs is so small, as before related; yet upon good Land, where the Corn has stood thin upon the Ground, I have known eight and ten Quarters reaped from an Acre, over the whole Field, and sometimes much more. And I have been informed by Persons of great Credit, that on good Land, which was drilled and managed with the Horse Hoe, they have had twelve Quarters from an Acre of Land, which is a great Produce; and this is with greater Certainty, if the Seasons prove bad, than can be expected by the common Husbandry.

The Price of Corn varies continually; and this Variation is often very great in the Space of 1 or 2 Years; so that from being so cheap, as that the Farmers could not pay their Rents, in the Compass of a Year or two, the Price has been doubled; for one or two plentiful Harvests have lowered the Price of Wheat so much as to make it difficult for the needy Farmer to go on with his Business who wants ready Money for his Crops, as soon as he can prepare them for the Market. This has established a Set or People called Dealers in Corn who have taken the Advantage of the Farmer's

Necessity, and engrossed their Corn to keep it for better Markets, and these Dealers have of late Years increased so greatly in their Numbers, to the great Prejudice of the Raisers and consumers of Corn, as may in Time prove fatal to the Country, by monopolizing the greatest Part of the Produce, and then set their own Price upon it; so that between these Corn Factors as they are called, and the Distillers, the Price of Bread may be too great for the labouring Poor; which is an Affair that requires more publick Attention than has yet been given to it.

The French are building publick Granaries for the Conservation of their Corn, in most of their Provinces, for as in some Years they have great Plenty of Corn, and at other Time as great Scarcity; they are contriving to prevent any great Want of it.

When the Wheat is sold much under four Shillings the Bushel, the farmer cannot pay his Rent, and live, nor can the poorer Sort of People afford to purchase good Bread, when the Wheat is sold at a Price much higher than six Shillings the Bushel; therefore when it is at a Medium between these, there can be no great Cause of Complaint on either Side.

TRIUMFETTA. Plum. Gen. Nov. 40. Tab. 8. Lin. Gen. Pl. 529.

The Characters are,

The Flower has no Empalement; it has 5 linear, erect, obtuse Petals, which are concave and turn inward; it has 15 or 16 rising Stamina, which are Awl-shaped, erect, and the Length of the Petals, terminated by single Summits; and a roundish Germen, supporting a Style the Length of the Stamina, crowned by an acute bifid Stigma. The Germen afterward becomes a globular Capsule, set with long Prickles on every Side, having 4 Cells, each containing 1 Seed, which is convex on one Side and angular on the other.

There is but one Species of this Genus at present known, viz.

TRIUMFETTA. Hort. Cliff. 210. This is entitled by Plumier, *Triumfetta fructu echinato racemoso*. Gen. Pl. 40. *Triumfetta* with prickly branching Fruit.

This Plant grows naturally in Jamaica and most of the other Islands of the West-Indies; it rises with an upright Stem to the Height of 6 or 7 Feet, which becomes ligneous toward the Bottom, and divides upward into 4 or 5 Branches, garnished with Leaves placed alternately their whole Length; these are about 2 Inches and a Half long, and almost 2 Inches broad toward their Base, divided almost into 3 Lobes toward the Top, and the middle Division ending in an acute Point; they are veined on their under Side, are covered with a soft brown Down, and have several Veins running from the Mid-rib to the Sides; their upper Side is of a yellowish green, and a little hairy; their Borders are acutely, but unequally sawed, and stand on Foot Stalks an Inch long. The Branches are terminated by long Spikes of Flowers, which come out in Clusters from the Side of the principal Foot Stalk at Distances of about an Inch. The Flowers are small, the Petals narrow and of a yellow Colour; these are succeeded by burry Capsules, something like those of Agrimony, but round; the Prickles are longer than those, and are placed on every Side. This Plant generally flowers here in July

and August, and in warm Seasons the Seeds sometimes ripen in England.

It is propagated by Seeds, which must be sown on a hot Bed early in the Spring; and when the Plants are come up, they should be each transplanted into a separate Pot filled with light fresh Kitchen Garden Earth, and plunged into a moderate hot Bed of Tanners Bark; they must be shaded from the Sun until they have taken new Root; after which Time, they must be treated as other tender exotick Plants. During the Summer Season the Plants may remain in this hot Bed; but in Autumn they must be removed into the Stove, and plunged into the Bark Bed, observing to refresh them with Water frequently; but in very cold Weather it must not be given them in too great Plenty. If the Plants live through the Winter, they will flower the following Summer; so will ripen their Seeds in Autumn, but they may be continued two or three Years, provided they are carefully managed.

TROLLIUS Lin. Gen. Pl. 620. *Helleborus*. Tourn. Inst. R. H. 272. Globe Ranunculus, or Locker Gow-lans.

The Characters are,

The Flower has no Empalement; it has about 14 almost oval Petals, whose Points meet together; it has 9 Nectaria which are narrow, plain, incurved, and umbilicated, which are perforated at their Base, and a great Number of bristly Stamina, terminated by erect Summits, with numerous Germina sitting close like a Column, having no Styles, but are crowned by pointed Stigmas. The Germina afterward become so many Capsules, collected into an oval Head, each containing 1 Seed.

The Species are,

1. TROLLIUS corollis conniventibus, nectariis longitudine staminum. Lin. Sp. Pl. 556. Trollius with the Petals of the Flower meeting, and Nectaria the Length of the Stamina. *Helleborus niger, ranunculi folio, flore globoso majore*. Tourn. Inst. R. H. 272, Black Hellebore with a Crow Foot Leaf, and a large globular Flower, commonly called Globe Flower or Locker Gow-lans.

2. TROLLIUS corollis patentibus, nectariis longitudine petalorum. Lin. Sp. Plant. 557 Trollius with an open spreading Flower, and Nectaria the Length of the Petals. *Helleborus aconiti folio, flore globoso croceo*. Amman. Rutb. 101. Hellebore with a Wolfsbane Leaf and a globular Saffron-coloured Flower.

The 1st Sort grows naturally in the northern Counties in England, and in many Parts of Wales. I found it in great Plenty growing in the Park of Burrow Hall, in Lancashire; it has a perennial, fibrous, black Root, from which spring up many Leaves which, resemble those of Wolfsbane, and are cut into 5 Segments almost to the Bottom; the Stalk rises near 2 Feet high, it is smooth, hollow, and branches toward the Top; each Branch is terminated by one large yellow Flower, shaped like those of Crow Foot which has no Empalement. These are composed of several concave Petals, whose Points turn inward toward each other, covering the Parts of Generation, so are of a globular Form; whence it had the Title of Globe Ranunculus. It flowers the latter End of May and the Beginning of June, and the Seeds ripen in August. This Plant is frequently kept in Garden

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Gardens about *London*, and is easily propagated by parting the Roots, the best Time for doing this is the latter End of *September*, when the Leaves are beginning to decay. The Roots should not be divided into small Parts if they are expected to flower strong the following Year; these should be planted at a Foot Distance from each other, and require a shady Situation and a moist Soil. The Roots need not be removed or parted oftener than once in three Years, unless there is a Desire of increasing them.

The 2d Sort grows naturally in *Siberia*, from whence it was brought to the Imperial Garden at *Petersburg*, and has been communicated since to several Parts of *Europe*; this differs from the first in having larger Leaves, which are of a lighter green Colour; their Segments are fewer and larger, resembling those of the yellow Monks Hood. The Petals of the Flower spread open, and do not converge at their Points like those of the first Sort. The Flowers, Stamina, and Nectaria are of an elegant Saffron Colour. It flowers in *May*.

This Sort may be propagated and treated as the first, but it requires a moister Soil, and should have a shady Situation, but not under the Drip of Trees; it thrives best on a North Border where the Soil is loamy, but not too stiff. In such Situations the Plants will produce Seeds in *England*, for if they are in a dry Soil, or much exposed to the Sun, they frequently die in Summer. I have seen this Sort in the most flourishing State, where the Surface of the Ground was covered with Moss to keep it moist.

As the Flowers of both these Plants make a pretty Appearance during their Continuance, they deserve Place in every good Garden for Variety, especially as they will thrive in moist shady Places where few better Plants will live; and by thus suiting the Plants to the different Soils and Situations of a Garden, every Part may be furnished with Beauties, and a greater Variety may be preserved.

TROPEOLUM. *Lin. Gen. Pl. 421. Cardaminum. Tourn. Inst. R. H. 430. Tab. 244. Indian Cress.*

The Characters are,

The Empalement of the Flower is of 1 Leaf ending in 5 Points; it is erect, spreading, coloured, and falls off. The 2 under Segments are narrow; their Tail ends in a nectarious Horn, which is longer than the Empalement. The Flower has 5 roundish Petals inserted in the Segments of the Empalement; the 2 upper sit close to the Foot Stalk, but the lower have oblong hairy Tails. It has 8 short Awl-shaped Stamina, which decline and are unequal, terminated by oblong rising Summits having 4 Cells, and a roundish Germen, with 3 Lobes which are streaked, supporting a single erect Style, crowned by an acute trifid Stigma. The Germen afterward becomes a solid Fruit in 3 Parts, convex on the Outside, angular within, having many Furrows, each Part or Cell including 1 furrowed Seed, convex on one Side, and angular on the other.

The Species are,

1. **TROPEOLUM** foliis subquinelobis, petalis obtusis. *Hort. Ups. 93. Tropeolum* with Leaves almost divided into 5 Lobes, and obtuse Petals to the Flower. *Cardaminum minus & vulgare. Tourn. Inst. R. H. 430.* The common or smaller *Indian Nasturtium*.

2. **TROPEOLUM** foliis integris, petalis acuminato seta-

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ceis. Hort. Ups. 93. Tropeolum with entire Leaves, and acute-pointed bristly Petals to the Flower. *Cardaminum ampliore folio & majore flore. Tourn. Inst. R. H. 430. Indian Nasturtium* with a larger Leaf and Flower, commonly called *Indian Cress*.

The 1st Sort grows naturally in *Peru*; this was first brought to *Europe* in 1684, and was raised in the Gardens of Count *Beverning* in *Holland*.

It has a trailing herbaceous Stalk garnished with Leaves almost circular. The Foot Stalk is inserted in the Center of the Leaf, like a Buckler, as in the Navelwort; the Leaves are smooth, and of a grayish Colour; the Flowers come out from the Wings of the Stalks, standing on very long slender Foot Stalks; they are of an admirable Structure, and are composed of 5 acute-pointed Petals; the 2 upper are large and rounded; the 3 under are narrow, and their Tails join together, and are lengthened into a Tail 2 Inches long. After the Flower is past, the Germen turns to a roundish Fruit which is furrowed, and divided into 3 Lobes, each including 1 streaked Seed. It flowers from Midsummer till the Frost stops it in Autumn.

There are two Varieties of this, one with a deep Orange-coloured Flower inclining to red, and the other with a pale yellow Flower.

The 2d Sort grows naturally about *Lima*; this has larger Stalks than the former. The Leaves are also larger, and their Borders are indented almost into Lobes; the Flowers are larger, and their Petals are rounded at their Points. There are 2 Colours of this Sort as in the former, and one with double Flowers, which is propagated by Cuttings, for it does not produce Seeds.

The 1st Sort is less common at present in the *English* Gardens than the second, the Flowers of the latter being larger make a finer Appearance, for which it is preferred; they are both esteemed annual Plants, though they may be continued through the Winter if they are kept in Pots, and sheltered in a good Green-house, in like Manner as that with double Flowers, is preserved, and they may be propagated by Cuttings as that is; but, as these ripen their Seeds constantly every Year, the Plants are generally raised from Seeds, which may be sown in *April* in the Places where they are to remain, which should be where their Stalks may have Support, for they will climb 6 or 8 Feet high, when they are trained up, and then their Flowers will make a good Appearance, but when they trail on the Ground, they will spread over the neighbouring Plants, and become unsightly.

The Flowers of these Plants, are frequently eaten in Sallads; they have a warm Taste like the Garden Cress, and are esteemed very wholesome; they are likewise used for garnishing Dishes. The Seeds are pickled, and by some are preferred to most Kinds of Pickles for Sauce.

TUBEROSE. See *Polyanthes*.

TUBEROSE ROOTS are such as consist of an uniform fleshy Substance, and are of a roundish Figure, as Turneps, &c.

TUBULOUS PLANTS are such whose Stems or Flowers are hollow like a Pipe.

TULIPA. *Tourn. Inst. R. H. 373. Tab. 199 & 200. Lin. Gen. Pl. 376. Tulip.*

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The Characters are,

The Flower has no Empalement; it is of the Bell Shape, and composed of 6 oblong, oval, concave, erect Petals; it has 6 Awl-shaped Stamina, shorter than the Petals, terminated by oblong four-cornered Summits, and a large, oblong, taper, three-cornered Germen, having no Style, crowned by a triangular, three-lobed, permanent Stigma. The Germen afterward turns to a three-cornered Capsule, having 3 Cells filled with compressed Seeds lying over each other in a double Order.

The Species are,

1. *TULIPA flore subnutante, foliis lanceolatis. Lin. Sp. Pl. 305.* Tulip with a nodding Flower, and Spear-shaped Leaves. *Tulipa minor lutea Italica. C. B. P. 63.* The smaller yellow Italian Tulip.

2. *TULIPA flore erecto, foliis ovato-lanceolatis. Lin. Sp. Pl. 306.* Tulip with an erect Flower, and oval Spear-shaped Leaves. This is the common Tulip with all its Varieties.

The 1st Sort was formerly preserved in the English Gardens, but since there has been so many Varieties of the 2d Sort propagated in England, the first has been rejected, and is now only to be found in old neglected Gardens. The Petals of this Flower end in acute Points; the Flower is yellow, and nods on one Side, and the Leaves are narrower than those of the common Sort.

The common Tulip is so well known as to need no Description, and it would be to little Purpose to enumerate the several Varieties of these Flowers, which may be seen in one good Garden, since there is no End of their Numbers, and what some People may value at a considerable Rate, others reject; and as there are annually a great Variety of new Flowers obtained from Breeders, those which are old, if they have not very good Properties to recommend them, are thrown out and despised, I shall therefore point out the Properties of a good Tulip, according to the Characteristicks of the best Florists of the present Age. 1. It should have a tall strong Stem. 2. The Flower should consist of six Leaves, three within and three without; the former ought to be larger than the latter. 3. Their Bottom should be proportioned to their Top, and their upper Part should be rounded off, and not terminate in a Point. 4. These Leaves, when opened, should neither turn inward, nor bend outward, but rather stand erect, and the Flower should be of a middling Size, neither over large, nor too small. 5. The Stripes should be small and regular, arising from the Bottom of the Flower, for if there are any Remains of the former self-coloured Bottom, the Flower is in Danger of losing its Stripes again. The Chives should not be yellow, but of a brown Colour. When a Flower has all these Properties, it is esteemed a good one.

Tulips are generally divided into three Classes, according to their Seasons of flowering; as *Præcoces*, or early Blowers, *Medias*, or middling Blowers, and *Serotines*, or late Blowers, but there is no Occasion for making any more Distinctions than two, viz. Early and late Blowers.

The early-blowing Tulips are not near so fair, nor rise half so high, as the late ones, but are chiefly valued for appearing so early in the Spring, some of which will flower the Middle of February in mild Seasons, if

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planted in a warm Border near a Wall, Pale, Hedge, or other Shelter, and the others will succeed them; so that they keep flowering until the general Season for these Flowers is come, which is toward the End of April. As these early-blowing Tulips are but few, I shall insert the Names of the principal of them, which are as follow:

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| 1. Duke Van Toll, or Winter Duke. | 21. Vice-roy. |
| 2. General Duke. | 22. Maria. |
| 3. General Brancion. | 23. Aurora Van Bart. |
| 4. Pretty Betty. | 24. Paragon Grebberi. |
| 5. Dutchess of Brancion. | 25. Galatea. |
| 6. Lac Verine. | 26. Marquis. |
| 7. Violet Ragans. | 27. Gilden Bloemen. |
| 8. Violet Remow, or Pourpre Lisse. | 28. Alcetus. |
| 9. Palto Van Leyden. | 29. Jewel Van Harlaem. |
| 10. Florifante. | 30. Jacht Van Delft. |
| 11. Brandenburg. | 31. Goude Son. |
| 12. Nonsuch. | 32. Flamboyant. |
| 13. Admiral Crinki. | 33. Bruyd Renard. |
| 14. General Molswick. | 34. Palamedes. |
| 15. Paragon Cleremont. | 35. Apollo. |
| 16. Admiral Encusen. | 36. Juno. |
| 17. Morillion. | 37. Silver-boot. |
| 18. Noblest. | 38. Florida Voorhelm. |
| 19. Early Perfect. | 39. Roy d'Espagne. |
| 20. Superintendent. | 40. Metropolit. |
| | 41. Konings-kroon. |

These are the Names which have been imposed on these Flowers by the Florists of the several Countries where they were raised, and by which the Roots may be obtained from Flanders and Holland, where the Florists are very exact in keeping up their Lists of these Flowers complete.

The Roots of these early-blowing Tulips should be planted the Beginning of September in a warm Border, near a Wall, Pale, or Hedge, because if they are put into an open Spot of Ground, their Buds are in Danger of suffering by Morning Frosts in the Spring. The Soil for these should be renewed every Year, where People intend to have them fair. The best Soil for this Purpose is that which is taken from a light sandy Pasture, with the Turf rotted amongst it, and to this should be added a fourth Part of Sea Sand. This Mixture may be laid about ten Inches deep, which will be sufficient for these Roots, which need not be planted more than four or five Inches deep at most. The Offsets should not be planted amongst the blowing Roots, but in a Border by themselves, where they may be planted pretty close together, especially if they are small; but these should be taken up when their Leaves decay, in the same Manner as the blowing Roots, otherwise they would rot, if the Season should prove very wet, for these are not so hardy as the late Blowers, nor do they increase half so fast as those, so that a greater Care is required to preserve the Offsets of them.

When these Tulips come up in the Spring, the Earth upon the Surface of the Borders should be gently stirred and cleared from Weeds, and as the Buds appear, if the Season should prove very severe, it will be of great Service to cover them with Mats, for Want of which many Times they are blighted, and their Flowers decay before they blow, which is often injuri-

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ous to the Roots, as is also the cropping of the Flowers, so soon as they are blown, because their Roots, which are formed new every Year, are not at that Time arrived to their full Magnitude, and are hereby deprived of proper Nourishment.

If, when these Flowers are blown, the Season should prove very warm, it will be proper to shade them with Mats, &c. in the Heat of the Day, as also if the Nights are frosty, they should be in like Manner covered, whereby they may be preserved a long Time in Beauty; but, when their Flowers are decayed, and their Seed Vessels begin to swell, they should be broken off just at the Top of the Stalks, because if they are permitted to seed, it will injure the Roots.

When the Leaves of these Flowers are decayed (which will be before the late Blowers are out of Flower), their Roots should be taken up, and spread upon Mats in a shady Place to dry; after which they should be cleared from their Filth, and put up in a dry Place, where the Vermin cannot come to them, until the Season for planting them again, being very careful to preserve every Sort separate, that you may know how to dispose of them at the Time for planting them again, because it is the better Way to plant all the Roots of each Sort together (and not to intermix them, as is commonly practised in most other Kinds of Flowers); for as there are few of them which blow at the same Time, so, when the several Roots of one Sort are scattered through a whole Border, they make but an indifferent Appearance; whereas, when twenty or thirty Roots of the same Sort are placed together, they will all flower at the same Time, and afford a more agreeable Prospect.

There are many curious Persons, who in order to preserve their several Kinds of Tulips and other bulbous-rooted Flowers, separate, have large flat Boxes made, which are divided into several Parts by small Partitions, each of which is numbered in the same Manner as the Divisions of their Beds; so that when a Catalogue of their Roots is made, and the Numbers fixed to each Sort in the Beds, there is nothing more to do when they take up their Roots, but to put every Kind into the Division marked with the same Number which was placed to each Sort in the Bed, which saves a great deal of Trouble in making fresh Marks every Time the Roots are taken up, and effectually answers the Purpose of preserving the Kinds separate.

The several Sorts of these early-blowing Tulips rise to different Heights in their Stems, so that scarcely any two of them grow to an equal Height. The Duke Van Toll, being one of the first that appears in the Spring, is generally very short-stalked, and so the other Sorts, in Proportion to their Earliness, are shorter than those which succeed them, and the late-blowing Kinds are all of them considerably longer in their Stems than any of the *Precoces*, or early Blowers; so that when they are confusedly mixed together, they make a very indifferent Appearance.

The late-blowing Tulips are so numerous, that, as I before observed, it would be to no Purpose to attempt to give a Catalogue of them. These are generally obtained from Breeders, which is a Term applied to all such Flowers as are produced from Seeds, which are of

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one Self-colour, and have good Bottoms and Chives; these in Time break into various beautiful Stripes, according to the Ground of their former Self-colour, but this must be entirely thrown off, otherwise they do not esteem a Flower well broken.

Of these Breeders there hath been a great Variety brought into England from Flanders of late Years, which is the grand Nursery for most Sorts of bulbous-rooted Flowers, but there are some curious Persons who have lately obtained many valuable Breeders from Seed sown in England; and doubtless, were we as industrious to sow the Seeds of these Flowers as the People of France and Flanders, we might in a few Years have as great a Variety as is to be found in any Part of Europe; for, although it is six or seven Years from the sowing before the Flowers blow, yet, if after the first Sowing there is every Year a fresh Parcel sown, when the seven Years are expired, there will be constantly a Succession of Roots to flower every Year, which will reward the Expectation, and keep up the Spirit of Raising; but it is the Length of Time at first which deters most People from this Work.

The Manner of propagating these Flowers from Seeds is as follows; You should be careful in the Choice of the Seed, without which there can be little Success expected. The best Seed is that which is saved from Breeders which have all the good Properties before related, for the Seeds of striped Flowers seldom produce any Thing that is valuable.

The best Method to obtain good Seeds is to make Choice of a Parcel of such breeding Tulip Roots as you would save Seeds from, and place them in a separate Bed from the Breeders, in a Part of the Garden where they may be fully exposed to the Sun, observing to plant them at least nine Inches deep; for if they are planted too shallow, their Stems are apt to decay before their Seed is perfected.

These Flowers should always be exposed to the Weather, for if they are shaded with Mats, or any other Covering, it will prevent their perfecting the Seed. About the Middle of July (a little sooner or later, as the Summer is hotter or colder) the Seeds will be fit to gather, which may be known by the Driness of their Stalks, and the opening of the Seed Vessels, at which Time it may be cut off, and preserved in the Pods till the Season for sowing it, being careful to put it up in a dry Place, otherwise it will be subject to mould, which will render it good for little.

Having saved a Parcel of good Seed, about the Beginning of September is the best Season for sowing it, when there should be provided a Parcel of shallow Seed Pans or Boxes, which should have Holes in their Bottoms, to let the Moisture pass off; these must be filled with fresh sandy Earth, laying the Surface very even, upon which the Seeds should be sown as regularly as possible, that they may not lie upon each other; then there should be some of the same light sandy Earth sifted over them about half an Inch thick. These Boxes or Pans, should be placed where they may have the Morning Sun till eleven of the Clock, in which Situation they may remain until October, at which Time they should be removed into a more open Situation, where they may enjoy the Benefit of the Sun all the Day,

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Day, and be sheltered from the North Winds, where they should remain during the Winter Season, but in the Spring, when the Plants are up, they should be again removed to their first Situation; and if the Season should be dry, they must be refreshed with Water, while the Plants remain green, but as soon as their Tops begin to decay, there must be no more given them, lest it rot their tender Bulbs, therefore the Boxes should be placed in a shady Situation during the Summer Season, but not under the Drip of Trees.

These Plants, at their first Appearance, have very narrow grassy Leaves very like those of Onions, and come up with bending Heads, in the same Manner as they do; so that Persons, who are unacquainted with them, may pull them up instead of Grass, whilst they are very young, before their Leaves are a little more expanded, which is rarely performed the first Year, for they seldom appear before the Middle of *March*, and they commonly decay about the latter End of *May*, or the Beginning of *June*, according as the Season is hotter or colder.

The Weeds and Mofs should also be cleared off from the Surface of the Earth in the Boxes, and a little fresh Earth sifted over them soon after their Leaves decay, which will be of great Service to the Roots. These Boxes should be constantly kept clear from Weeds, which, if permitted to grow therein, when they are pulled up, their Roots will be apt to draw the Bulbs out of the Ground. At *Michaelmas* they should be fresh earthed again, and as the Winter comes on, they must be again removed into the Sun as before, and treated in the same Manner, until the Leaves decay in the Spring, when the Bulbs should be carefully taken up, and planted in Beds of fresh sandy Earth, which should have Tiles laid under them, to prevent the Roots from shooting downward, which they often do when there is nothing to stop them, and thereby they are destroyed. The Earth of these Beds should be about five Inches thick upon the Tiles, which will be sufficient for nourishing these Roots while they are young.

The Distance, which these young Bulbs should be allowed, need not be more than two Inches, nor should they be planted above two Inches deep; but toward the End of *October*, it will be proper to cover the Beds over with a little fresh Earth about an Inch deep, which will preserve the Roots from the Frost, and prevent Mofs or Weeds from growing over them; but, if the Winter should be very severe, it will be proper to cover the Bed either with Mats or Peas Haulm to prevent the Frost from entering the Ground, because these Roots are much tenderer while young, than they are after they have acquired Strength.

In the Spring the Surface of the Ground should be gently stirred, to make it clean, before the Plants come up; and if the Spring should prove dry, they must be frequently refreshed with Water, during the Time of their Growth; but this must not be given to them in great Quantities, lest it rot their tender Bulbs; and when the Leaves are decayed, the Weeds should be taken off, and the Beds covered with fresh Earth; which should also be repeated again in Autumn.

In these Beds the Bulbs may remain two Years; during which Time they must be constantly kept clear from Weeds, and in the Spring and Autumn fresh earthed, in

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the Manner already directed; after which the Bulbs must be taken up, and planted into fresh Beds, at four Inches asunder, and as many deep, where they may remain two Years more; during which Time they should have the same Culture as before; and after that, the Bulbs being large enough to blow, they should be taken up, and planted in fresh Beds at the usual Distance, and in the same Manner as old Roots; where, when they flower, such of them as are worthy to be preserved should be marked with Sticks, and at the Season for taking up the Bulbs, they must be separated from the others, in order to be planted as Breeders in different Beds; but you should by no means throw out the rest until they have flowered two or three Years, because it is impossible to judge exactly of their Value in less Time; for many, which at first flowering appear beautiful, will afterwards degenerate so as to be of little Value, and others, which did not please at first, will many Times improve; so that they should be preserved until their Worth can be well judged of.

In this Method many Sorts of new Breeders will be annually raised, from which there will always be fine Flowers broken, which, being the Produce of a Person's own Sowing, will be greatly valued, because they are not in other Hands, which is what enhances the Price of all Flowers; and it has been entirely owing to this Method of raising new Flowers, that the *Dutch* have been so famous, amongst whom the Passion for fine Tulips did some Time reign so violently, that many of the Florists near *Haerlem* have often given a hundred Ducats for one single Root, which Extravagance was the Occasion of an Order being made by the *States*, to limit the utmost Price that should be afterward given for any Tulip Root, were it ever so fine.

Having thus given an Account of the Method of raising these Flowers from Seeds, I shall now proceed to the Management of these Roots which are termed Breeders, so as to have some of them every Year break out into fine Stripes.

There are some who pretend to have a Secret how to make any Sort of Breeders break into Stripes whenever they please, but this, I dare say, is without Foundation; for from many Experiments which I and others have made of this Kind, I never could find any Certainty of this Matter. All that can be done by Art, is, to shift the Roots every Year into fresh Earth of different Mixtures and a different Situation, by which Method I have had very good Success.

The Earth of these Beds should be every Year different, for although it is generally agreed that lean hungry fresh Earth doth hasten their breaking, and cause their Stripes to be the finer, and more beautiful, yet, if they are every Year planted in the same Sort of Soil, it will not have so much Effect on them, as if they were one Year planted in one Sort of Earth, and the next Year in a very different one, as I have several Times experienced; and if some fine striped Tulips are planted in the same Beds with the Breeders intermixing them together, it will also cause the Breeders to break the sooner.

The best Compost for these Roots is a third Part of fresh Earth from a good Pasture, which should have the Sward rotted with it; a third Part of Sea Sand, and the

the other Part sifted Lime Rubbish ; these should be all mixed together six or eight Months at least before it is used, and should be frequently turned in order to mix the Parts well together. With this Mixture the Beds should be made about two Feet deep, after the following Manner : After the old Earth is taken from out of the Bed to the Depth intended, then some of the fresh Earth should be put in about eighteen Inches thick ; this should be leveled exactly, and then Lines drawn each Way of the Bed, Chequerwise ; at six Inches Distance, upon the Center of each Cross, should be placed the Tulip Roots in an upright Position, and after having finished the Bed in this Manner, the Earth must be filled in, so as to raise the Bed six or eight Inches higher, observing, in doing this, not to displace any of the Roots, and also to lay the Top of the Beds a little rounding, to throw off the Water.

There are many Persons who are so careless in planting their Tulip Roots, as only to dig and level the Beds well, and then with a blunt Dibble to make Holes, into which they put the Roots, and then fill up the Holes with a Rake, but this is by no means a good Method ; for the Dibble, in making the Holes, presses the Earth closely on each Side, and at the Bottom, whereby the Moisture is often detained so long about the Roots as to rot them, especially if the Soil is inclinable to bind ; besides, the Earth being hard at the Bottom of the Bulbs, they cannot so easily emit their Fibres, which must certainly prejudice the Roots.

These Beds should be sunk, more or less, below the Surface, according to the Moisture or Driness of the Ground, for the Roots should be so elevated as never to have the Water stand near the reach of their Fibres in Winter, for Moisture is very apt to rot them ; so that where the Soil is very wet, it will be proper to lay some Lime Rubbish under the Earth, in order to drain off the Wet, and the Beds should be entirely raised above the Level of the Ground ; but to prevent their falling down into the Walks, after Frost, or hard Rains, it will be proper to raise the Paths between them, either with Sea Coal Ashes or Rubbish, eight or ten Inches, which will support the Earth of the Beds ; and these Paths may slope at each End from the Middle, which will make Passage for the Water to run off as it falls. But where the Soil is dry, the Beds may be sunk eighteen or twenty Inches below the Surface, for in such Places the Beds need not be more than four or six Inches above the Surface, which will be Allowance enough for their settling.

During the Winter Season there will be no farther Care required. The Roots, being planted thus deep, will be in no Danger of suffering by ordinary Frosts, but if the Winter should prove very severe, some rotten Tan or Peas Haulm may be laid over the Beds to keep out the Frost during this Continuance, but this must be removed when the Frost is over ; and in the Spring, when their Leaves begin to appear above Ground, the Earth upon the Surface of the Beds should be stirred to clear it from Weeds, Moss, &c. and when the Flower Buds begin to come up, they should be guarded from Frost, otherwise they are very subject to blight and decay soon after they appear, if the Frost pinches their Tops ; but they need only be covered in such Nights

when there is a Prospect of Frost, for at all other Times they should have as much open Air as possible, without which they will draw up weak, and produce very small Flowers.

When these Breeders are in flower, you should carefully examine them to see if any of them have broken into beautiful Stripes, which, if you observe, there should be a Stick put into the Ground, by every such Root, to mark them, that they may be separated from the Breeders, to plant amongst the striped Flowers the following Year ; but you should carefully observe, whether they have thrown off their former Colour entirely, as also when they decay, to see if they continue beautiful to the last, and not appear smeared over with the original Colour, in both which Cases they are very subject to go back to their old Colour the next Year : But if their Stripes are distinct and clear to the Bottom, and continue so to the last (which is what the Florists call dyeing well), there is no great Danger of their returning back again, as hath been by some confidently reported, for if one of these Flowers is quite broken (as it is termed), it will never lose its Stripes, though sometimes they will blow much fairer than at others, and the Flowers of the Offsets will be often more beautiful than those of the old Roots.

This Alteration in the Colour of these Flowers may be seen long before they are blown, for all the green Leaves of the Plant will appear of a fainter Colour, and seem to be striped with white, or of a brownish Colour, which is a plain Proof that the Juices of the whole Plant are altered, or, at least, the Vessels through which the Juice is strained ; so that hereby Particles of a different Figure are capable of passing through them, which, when entered into the Petals of the Flower, reflect the Rays of Light in a different Manner, which occasions the Variety we see in the Colours of Flowers (but this is more fully explained in the Article *Vegetation* ; which see). This breaking of the Colours in Flowers proceeds from Weakness, or at least is the Cause of Weakness in Plants ; for it is observable that after Tulips are broken into fine Stripes, they never grow so tall as before, nor are the Stems, Leaves, or Flowers, so large, and it is the same in all other variegated Plants and Flowers whatever, which are also much tenderer than they were before they were striped ; so that many Sorts of exotick Plants, which by Accident became variegated in their Leaves, are often rendered so tender, as not to be preserved without much more Care, though indeed the striping of Tulips doth never occasion so great Weakness in them as to render them very tender. The greatest Effect it hath on them, is in lessening their Growth, causing some (which, while they continued in their original plain Colours, did rise near three Feet in Height) to advance little more than two after their Colours were altered ; and the more beautifully their Stripes appear, the shorter will be their Stems, and the weaker their Flowers.

There is nothing more to be observed in the Culture of striped Flowers than what has been directed for Breeders, excepting that these should be arched over with tall Hoops and Rails, that they may be shaded from the Sun in the Day Time, and protected from strong Winds, hard Rains, and frosty Mornings, otherwise the Flow-

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ers will continue but a short Time in Beauty ; but where these Instructions are duly followed, they may be preserved in flower a full Month, which is as long as most other Flowers continue.

There are some Persons, who are so extremely fond of these Flowers, as to be at a great Expence in erecting large Frames of Iron Work to cover their Beds of Tulips, in such a Manner, that they may walk between two Beds under the Frames, over which are spread Tarpaulins, so as to keep off Sun, Rain, and Frost, whereby they can view the Flowers without being at the Trouble of taking off or turning up the Tarpaulins, or being incommoded by the Sun or Rain, which cannot be avoided where the covering is low ; besides, by thus raising the Covers, the Flowers have a greater Share of Air, so that they are not drawn so weak, as they are when the Covering is low and close to them, but these Frames, being expensive, can only be made by Persons of Fortune ; however, there may be some of Wood contrived at a smaller Expence, which, being arched over with Hoops, may answer the Purpose as well as the Iron Frames, though they are not so sightly or lasting.

But after the Flowers are faded, the Heads of all the fine Sorts should be broken off to prevent their seeding ; for if this is not observed, they will not flower near so well the following Year, nor will their Stripes continue so perfect ; and this will also cause their Stems to decay sooner than otherwise they would do, so that their Roots may be taken up early in June ; for they should not remain in the Ground after their Leaves are decayed. In taking the Roots out of the Ground, you must be very careful not to bruise or cut them, which will endanger their rotting, and if possible, it should be done a Day or two after Rain. When these Roots are taken out of the Ground, they must be cleared from their old Covers, and all Sorts of Filth, and spread upon Mats in a shady Place to dry, after which they should be put up in a dry Place, where Vermin cannot get to them, observing to keep every Sort separated, but they should not be kept too close from the Air, nor suffered to lie in Heaps together, lest they should grow mouldy, for if any of the Roots once take the Mould, they commonly rot, when they are planted again.

The Offsets of these Roots, which are not large enough to produce Flowers the succeeding Year, should be also put by themselves, keeping each Sort distinct ; these should be planted about a Month earlier in Autumn than the blowing Roots, in particular Beds by themselves in the Flower Nursery, where they may not be exposed to publick View ; but the Earth of the Beds should be prepared for them in the same Manner as for larger Roots, though these should not be planted above five Inches deep, because they are not strong enough to push through so great Covering of the Earth as the old Roots ; they may be placed much nearer together than those which are to flower, and in one Year most of them will become strong enough to flower, when they may be removed into the Flower Garden, and placed in the Beds amongst those of the same Kinds.

TULIPIFERA. *Herm. Hort. Leyd. Boerb. Ind. Plant. 11. p. 262. Liriodendrum, Lin. Gen. Pl. 609.* The Tulip Tree.

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The Characters are,

The proper Involucrum of the Flower is composed of 2 angular Leaves, which fall off ; the Empalement is composed of 3 oblong plain Leaves like Petals, which fall away. The Flower is nearly of the Bell Shape and has 6 Petals, which are obtuse and channeled at their Base ; the 3 outer fall off ; it has a great Number of narrow Stamina, which are inserted to the Receptacle of the Flower, having long narrow Summits fastened to their Side, and many Germina disposed in a Cone, having no Style, crowned by a single globular Stigma. The Germina become scaly Seeds lying over each other like the Scales of Fish, and form the Resemblance of a Cone.

We know but one Species of this Genus, viz.

TULIPIFERA. The Tulip Tree. This is by *Herman* titled *Tulipifera Arbor Virginiana. H. L. The Virginia Tulip Tree.*

This is a Native of North America, where it grows to be a Tree of the first Magnitude, and is generally known through all the English Settlements by the Title of Poplar. Of late Years there has been great Numbers of these Trees raised from Seeds in the English Gardens, so that now they are become common in the Nurseries about London, and there are many of the Trees in several Parts of England which annually produce Flowers. The first Tree of this Kind which flowered here, was in the Gardens of the late Earl of *Peterborough* at *Parsons Green* near *Fulham* ; which was planted in a Wilderness among other Trees ; before this was planted in the open Air, the few Plants which were then in the English Gardens, were planted in Pots and housed in Winter, supposing they were too tender to live in the open Air, but this Tree soon after it was placed in the full Ground, convinced the Gardeners of their Mistake, by the great Progress it made, while those which were kept in Pots and Tubs, increased slowly in their Growth ; so that afterward there were many others planted in the full Ground, which are now arrived to a large Size, especially those which were planted in a moist Soil. One of the handsomest Trees of this Kind near London, is in the Garden of *Waltham Abbey* ; and at *Wilton* the Seat of the Earl of *Pembroke*, there are some Trees of great Bulk ; but the old Tree at *Parsons Green* is quite destroyed by the other Trees which were suffered to over-hang it, and rob it of its Nourishment, from a Fear of taking down the neighbouring Trees, lest by admitting the cold Air to the Tulip Tree it would injure it.

The young Shoots of this Tree are covered with a smooth purplish Bark ; they are garnished with large Leaves, whose Foot Stalks are 4 Inches long ; they are ranged alternate, the Leaves are of a singular Form being divided into 3 Lobes ; the middle Lobe is blunt and hollowed at the Point, appearing as if it had been cut with Scissars. The two Side Lobes are rounded, and end in blunt Points. The Leaves are from 4 to 5 Inches broad near their Base, and about 4 Inches long from the Foot Stalk to the Point, having a strong Mid-rib, which is formed by the Prolongation of the Foot Stalk. From the Mid-rib run many transverse Veins to the Borders, which ramify into several smaller. The upper Surface of the Leaves is smooth, and of a lucid green, the under is of a pale green. The Flowers are

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are produced at the End of the Branches, they are composed of 6 Petals; 3 without, and 3 within, which form a Sort of Bell shaped Flower, from whence the Inhabitants of *North America* gave it the Title of Tulip. These Petals are marked with green, yellow, and red Spots, so make a fine Appearance when the Trees are well charged with Flowers. The Time of this Tree's flowering is in *July*, and when the Flowers drop, the Germen swells and forms a Kind of Cone, but these do not ripen in *England*.

Mr. *Catesby*, in his *Natural History of Carolina*, &c. says, There are some of these Trees in *America*, which are 30 Feet in Circumference; that the Boughs are unequal and irregular, making several Bends or Elbows, which render the Trees distinguishable at a great Distance, even when they have no Leaves upon them. They are found in most Parts of the northern Continent of *America*, from the Cape of *Florida* to *New England*, where the Timber is of great Use; particularly for making of *Periaugues*, the Trunks of these being large enough to be hollowed into the Shape of those Boats, so they are of one Piece.

This Tree is propagated by Seeds, which are now annually imported in great Plenty from *America*. These may be either sown in Pots or Tubs filled with light Earth, from the Kitchen Garden; or in a Bed in the full Ground. Those which are sown in the first Way, may be placed on a gentle hot Bed, which will forward their Growth, so that the Plants will acquire more Strength before Winter. If they are thus treated, the Glasses of the hot Bed should be shaded from the Sun every Day, and the Earth in the Pots should be frequently refreshed with Water, for unless it is kept moist, the Seeds will not grow, but this must be done with Care, so as not to make it too wet, which will rot the Seeds. When the Plants appear, they must be still shaded in the Heat of the Day from the Sun, but fresh Air must be admitted daily to prevent their drawing up weak, and as the Season advances, they must be gradually hardened to bear the open Air. While the Plants are young, they do not Care for much Sun, so they should either be shaded, or placed where the Morning Sun only shines upon them; they must also be constantly supplied with Water, but not have it in too great Plenty. As the young Plants commonly continue growing late in the Summer, so when there happens early Frosts in Autumn, it often kills their tender Tops, which occasions their dying down a considerable Length in Winter, therefore they should be carefully guarded against these first Frosts, which are always more hurtful to them than harder Frosts afterward, when their Shoots are better hardened; however, the first Winter after the Plants come up, it will be the better Way to shelter them in a common hot Bed Frame; or to arch them over with Hoops, and cover them with Mats, exposing them always to the open Air in mild Weather.

The following Spring just before the Plants begin to shoot, they should be transplanted into Nursery Beds, in a sheltered Situation, where they are not too much exposed to the Sun. The Soil of these Beds should be a soft gentle Loam, not too stiff, nor over light; this should be well wrought and the Clods well broken,

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and made fine. There must be great Care taken not to break the Roots of the Plants in taking them up, for they are very tender; they should be planted again as soon as possible, for if their Roots are long out of the Ground, they will be much injured thereby. These may be planted in Rows at about a Foot Distance, and at six Inches Distance in the Rows, for as they should not remain long in these Nursery Beds, this will be Room enough for them to grow; and by having them so close, they may be shaded in the Summer, or sheltered in the Winter, with more Ease, than when they are farther apart.

When the Plants are thus planted, if the Surface of the Beds is covered with rotten Tanners Bark, or with Moss, it will prevent the Earth from drying too fast, so that the Plants will not require to be so often watered, as they must be where the Ground is exposed to the Sun and Air; after this, the farther Care will be to keep them clean from Weeds, and if the latter Part of Summer should prove moist, it will occasion the Plants growing late in Autumn, so their Tops will be tender and liable to be killed by the first Frosts. In this Case they should be covered with Mats to protect them.

If the Plants make great Progress the first Summer, they may be transplanted again the following Spring; Part of them may be planted in the Places where they are to remain, and the other should be planted in a Nursery where they may grow 2 Years to acquire Strength before they are planted out for good, though the younger they are planted in the Places where they are to stand, the larger they will grow, for the Roots run out into Length, and when they are cut, it greatly retards their Growth, so that these Trees should never be removed large; for they rarely succeed when they are grown to a large Size before. Some Trees I have seen removed pretty large, which have survived their Removal, but young Plants of 2 Years old which were planted near them, were much larger in fifteen Years than the old ones.

When the Seeds are sown on a Bed in the full Ground, the Bed should be arched over with Hoops, and shaded in the Heat of the Day from the Sun, and frequently refreshed with Water, as should also the Plants when they appear, for when they are exposed much to the Sun, they make but small Progress. The Care of these in Summer must be to keep them clean from Weeds, supplying them duly with Water, and shading them from the Sun in hot Weather; but as these Seeds will not come up so soon as those which were placed on a hot Bed, they generally continue growing later in Autumn, therefore will require Shelter from the early Frosts in Autumn; for as the Shoots of these will be much softer than those of the Plants which had longer Time to grow, so if the autumnal Frosts should prove severe, they will be in Danger of being killed down to the Surface of the Ground, by which the whole Summer's Growth will be lost, and sometimes the Plants are entirely killed by the Frost the first Winter, if they are not protected.

As these Plants will not have advanced so much in their Growth as the other, they should remain in the Seed Bed to have another Year's Growth before they are removed

removed, therefore all that will be necessary to observe the second Year is to keep them clean from Weeds, and now they will not be in so much Danger of suffering from the Warmth of the Sun, as before, therefore will not require such constant Care to shade them, nor should the watering of them be continued longer than the Spring, for if the Autumn should prove dry, it will prevent the Plants from shooting late, and harden those Shoots which were made early in the Year, whereby the Plants will be in less Danger from the early Frosts.

After the Plants have grown two Years in the Seed Bed, they will be strong enough to remove, therefore, in the Spring, just at the Time when their Buds begin to swell, they should be carefully taken up, and transplanted into Nursery Beds, and treated the same Way as the Plants, which were raised on a hot Bed.

There are some People who propagate this Tree by Layers, but the Layers are commonly two or three Years, before they take Root, and the Plants so raised, seldom make such strait Trees as those raised from Seeds though indeed they will produce Flowers sooner, as is always the Case with stunted Plants.

This Tree should be planted on a light loamy Soil, not too dry, on which it will thrive much better than on a strong Clay, or a dry gravelly Ground, for in America they are chiefly found on a moist light Soil, where they will grow to a prodigious Size, though it will not be proper to plant these Trees in a Soil which is too moist, because it might endanger the rotting of the Fibres of the Roots, by the Moisture continuing too long about them, especially if the Bottom be a Clay, or a strong Loam, which will detain the Wet.

TURKS CAP. See Lilium.

TURKEY WHEAT. See Zea.

TURNEP. See Rapa.

TURNERA. *Plum. Gen. Nov. 15. Tab. 12. Lin. Geh. Pl. 338.*

The Characters are,

The Empalement of the Flower is Funnel-shaped, of 1 Leaf, having an oblong, cylindrical, angular Tube, and is cut into 5 Segments. The Flower has 5 Heart-shaped, pointed, plain Petals, with narrow Tails which, are inserted in the Tube of the Empalement; it has 5 Awl-shaped Stamens, shorter than the Petals, inserted in the Empalement, and terminated by acute-pointed erect Summits, and a conical Germen, supporting 3 slender Styles, crowned by hairy many-pointed Stigmas. The Germen afterward turns to an oval Capsule with 1 Cell which opens at the Top with 3 Valves, and contains several oblong obtuse Seeds.

The Species are,

1. TURNERA foliis linearilanceolatis hirsutis obtusis serratis, acuminatis. Turnera with linear, Spear-shaped, hairy Leaves obtusely indented and acute-pointed. *Turnera hirsuta* folio. *Rand. Hort. Chelf.* Turnera with a Water Horehound Leaf.

2. TURNERA foliis ovato-lanceolatis serratis rugosis. Turnera with oval Spear-shaped Leaves, sawed and rough. *Turnera frutescens ulmifolia. Plum. Gen. Nov. 15.* Shrubby Turnera with an Elm Leaf.

These Plants are both of them Natives of the warm Parts of America. The second Species was found by Father Plumier in Martinico, who gave it the Name of Turnera, from Dr. Turner, a famous English Physici-

an, who lived in Queen Elizabeth's Reign, and wrote an Herbal, in which he has chiefly figured and described the useful Plants.

The 1st Sort was discovered by Sir Hans Sloane, who has figured it in his *Natural History of Jamaica*, under the following Title; *Cistus urticae folio, flore luteo, vasculis trigonis.* Vol. 1. p. 202; but both these Sorts were observed by my late Friend Dr. William Houstoun, in several Parts of America.

The 1st Sort rises with a shrubby Stalk to the Height of 8 or 10 Feet, sending out Branches on every Side the whole Length; these are garnished with narrow Spear-shaped Leaves, which are hairy; they are near 3 Inches long, and about 3 Quarters of an Inch broad, terminating in acute Points; they are obtusely sawed on their Edges, and stand on very short Foot Stalks; these, when rubbed, emit a disagreeable Odour. The Flowers grow from the Foot Stalks of the Leaves, to which they sit very close, having 2 pretty large leafy Appendages to their Empalements. The Flowers are of a pale yellow Colour, and are composed of 5 large oval Petals, whose Tails are twisted and join; these are succeeded by short tubular Capsules having 1 Cell, which opens at the Top with 3 Valves which turn back, and let out the Seeds.

The 2d Sort has a shrubby Stalk like the first, and rises to the same Height. The Branches of this are slender, and stiffer than those of the former. The Leaves are oval, Spear-shaped, two Inches and a Half long, and an Inch and a Half broad, rough on their upper Side, and of a lucid green; their under Side has many strong Veins, and is of a lighter green; they are sawed on their Edges, and have longer Foot Stalks than those of the first Species, and stand much farther asunder on the Branches. The Flowers sit close on the Foot Stalks of the Leaves, in like Manner as the former, but the Flowers are larger and of a brighter yellow than those of the former. These Differences remain constant, and never alter when raised from Seeds; so that from near 30 Years experience in sowing the Seeds, I may pronounce them different Species.

These Plants are easily propagated by sowing their Seeds on a hot Bed early in the Spring; and when the Plants are come up 2 Inches high, they should be transplanted into small Pots, and plunged into a hot Bed of Tanners Bark, observing to water and shade them until they have taken Root, after which they must be treated as the Guavas, and other tender Plants from the same Countries, to which the Reader is desired to turn, to avoid Repetition. The Seeds of these Plants will often fall into the Pots which are placed near them in the Stove, which will grow, and soon furnish Plants enough, after a Person is once possessed of them. As they are too tender to live in the open Air in England, they must be placed in the Bark Bed in the Stove; where, during the Winter Season, they must be kept warm, and frequently watered; but in the Summer Season, they must have a great Share of Air, otherwise they will draw up tender, and not produce many Flowers.

When the Plants are grown pretty large they may be treated more hardily, by placing them in the dry Stove; where, if they are kept in a moderate Degree of Heat, they will thrive and flower very well. Those

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who would save the Seeds of these Plants, must watch them carefully, because, when they are ripe, they soon scatter, if they are not gathered.

These Plants produce their Flowers great Part of the Year, if they are kept in a proper Degree of Warmth, so that there are some of the Flowers in Beauty for at least 9 or 10 Months, which renders the Plants more valuable.

TURNSOLE. See *Heliotropium*.

TURRITIS. *Tourn. Inst. R. H. 223. Dillen. Gen. Nov. 6. Lin. Gen. Pl. 733. Tower Mustard.*

The Characters are,

The Empalement of the Flower is composed of 4 oblong oval Leaves, which are erect, and close together. The Flower has 4 oblong, oval, entire Petals, placed in Form of a Cross, and 6 erect Awl-shaped Stamens the Length of the Tube, 2 of which are shorter than the other, terminated by single Summits, and a taper Germen a little compressed, having no Style, but crowned by an obtuse Stigma. The Germen afterward becomes a long four-cornered Pod with 2 Cells, divided by an intermediate Partition opening with 2 Valves and filled with small roundish indented Seeds.

The Species are,

1. *TURRITIS foliis radicalibus dentatis hispida, caulinis integerrimis amplexicaulibus glabris. Hort. Cliff. 339.* Tower Mustard with prickly lower Leaves indented, and the upper ones smooth, entire, and embracing the Stalk. *Turritis foliis inferioribus cicboraceis ceteris perfoliatis. Tourn. Inst. 224.* Tower Mustard with the under Leaves like Cicory, and the upper like Thorowax.

2. *TURRITIS foliis omnibus hispida, caulinis amplexicaulibus. Hort. Cliff. 339.* Tower Mustard with all the Leaves prickly, and the upper ones embracing the Stalk. *Erysimo similis bifurcata, non laciniata alba. C. B. P. 101.* A hairy Plant resembling Hedge Mustard, but the Leaves not jagged.

The 1st Sort grows naturally in several Parts of England, on Walls and dry Banks; this hath its lower Leaves much jagged on their Edges, and rough to the Touch. The Stalks rise a Foot and a Half high, and are garnished with smooth grayish Leaves, two Inches long, and three Quarters of an Inch broad at their Base, ending in Points; these embrace the Stalks with their Base. The upper Part of the Stalk has slender Branches, proceeding from the Wings of the Leaves, which sustain Spikes of small white Flowers, having 4 Petals placed in Form of a Cross. These appear in June, and are succeeded by long, slender, compressed, four cornered Pods, which grow erect close to the Stalk, and are filled with small Seeds which ripen in August.

The 2d Sort grows naturally on old Walls, and Buildings in the northern Counties of England; the lower Leaves are shaped like those of the Daisy, but are rough. The Stalks rise 8 or 10 Inches high, which are garnished with oval Leaves, whose Bases embrace the Stalks; they are as rough as the lower Leaves. The upper Part of the Stalks branch into slender Stalks, which sustain short Spikes of white Flowers like those of the former Sort, which are succeeded by slender Pods having 4 Corners, shorter than those of the first Sort. This Plant flowers earlier than the first, and the Seeds are ripe in July.

These Plants are sometimes kept in Gardens for Variety; but if their Seeds are scattered on an old Wall or

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Building, in Autumn, soon after they are ripe, the Plants will come up and thrive without farther Care, and their Seeds will scatter on the Walls, and spread, so there will be no Danger of the Plants maintaining the Situation, if they are not purposely destroyed.

The other Species are referred to *Arabis*, *Brassica*, and *Hesperis*, under which Articles they will be found.

TUSSILAGO. *Tourn. Inst. R. H. 487. Tab. 276. Lin. Gen. Pl. 856. Colt's-foot.*

The Characters are,

The Flower has 1 common cylindrical Empalement, whose Scales are linear, Spear-shaped, and equal. The Flower is made up of hermaphrodite Florets, which compose the Disk, and female half Florets which form the Rays or Border. The hermaphrodite Florets are Funnel-shaped, and cut at the Brim into 5 Segments; these have 5 short Hair-like Stamens, terminated by cylindrical Summits; and a short crowned Germen supporting a slender Style, crowned by a thick Stigma. The Germen afterward becomes an oblong compressed Seed crowned with a hairy Down. The female half Florets are stretched out on one Side with a narrow Tongue-shaped Segment; these have no Stamens but have a short crowned Germen, which turns to a Seed like those of the hermaphrodite Florets which ripen in the Empalement.

The Species are,

1. *TUSSILAGO scapo imbricato uniflora, foliis subcordatis, angulatis denticulatis. Lin. Hort. Cliff. 411.* Colt's-foot with an imbricated Stalk bearing one Flower, and angular indented Leaves, nearly Heart-shaped. *Tussilago vulgaris. C. B. P. 197.* Common Colt's-foot.

2. *TUSSILAGO scapo uniflora, foliis lyrate ovatis. Lin. Sp. Pl. 865.* Colt's-foot with one Flower on each Stalk, and oval Lyre-shaped Leaves. *Tussilago scapo uniflora, calyce clauso. Hort. Ups. 259.* Colt's-foot with one Flower on each Stalk, and a closed Empalement.

3. *TUSSILAGO scapo subnudo uniflora, foliis cordato-orbiculatis crenatis. Hort. Cliff. 411.* Colt's-foot with an almost naked Stalk bearing one Flower, and orbicular, Heart-shaped, crenated Leaves. *Tussilago Alpina rotundifolia glabra. C. B. P. 197.* Round-leaved smooth Colt's-foot of the Alps.

The 1st of these Sorts is very common in watery Places in almost every Part of England, and is rarely kept in Gardens; for the Roots creep under Ground, and increase so fast, that in a short Time they will spread over a large Spot of Ground. This Plant is so well known as to need no Description.

The 2d Sort grows naturally in Siberia; this is a very low Plant whose Leaves grow close to the Ground; they are of an oval Form and indented on the Sides like a Lute. The Flowers stand on short Foot Stalks which rise between the Leaves, and are 3 or 4 Inches long, each sustaining 1 Flower at the Top, of a dirty purplish Colour. These appear early in the Spring, and are succeeded by downy Seeds which ripen in June.

The 3d Sort grows naturally on the Alps; this is a low perennial Plant whose Leaves are round and indented at the Foot Stalk in Form of a Heart, and their Edges are crenated; their upper Surface is smooth, and of a bright green Colour; their under Sides are a little downy and whitish; their Foot Stalks arise from the Ground.

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Ground, and are 3 Inches long. The Foot Stalks of the Flowers which arise from the Root, are 4 Inches long, woolly, and sustain 1 purplish Flower at the Top, which is made up of hermaphrodite and female Florets, like those of the other Sorts.

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The two last are frequently kept in Gardens for Variety; they are easily propagated by parting their Roots in Autumn, and must be planted in a moist shady Border, where they will thrive, and require no farther Care but to keep them clean from Weeds.

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VACCARIA. See Saponaria.
VACCINIUM. Lin. Gen. Pl. 434. *Vitis. Idæa.* Journ. Inst. R. H. 607. Tab. 377. The Bill Berry, Whortle Berry, or Cranberry; in French, *Airelle* or *Myrtille*.

The Characters are,

The Flower has a small permanent Empalement sitting on the Germen; it is Bell-shaped, of 1 Petal which is slightly cut into 4 Segments at the Brim which turn backward; it has 8 Stamina, which are terminated by horned Summits having 2 Awns on their Backside which spread asunder; the Points open. The Germen is situated below the Flower, supporting a single Style longer than the Stamina, crowned by an obtuse Stigma; it afterward turns to an umbilicated globular Berry with 4 Cells, containing a few small Seeds.

The Species are,

1. **VACCINIUM pedunculis unifloris, foliis ovatis serratis deciduis, caule angulato.** Flor. Lapp. 143. Whortle Berry, with 1 Flower upon each Foot Stalk, oval sawed Leaves which fall off in Winter, and an angular Stalk. *Vitis Idæa foliis oblongis crenatis, fructu nigricante.* C. B. P. 470. Black Whorts, Whortle Berries, or Bilberries.

2. **VACCINIUM racemis terminalibus nutantibus, foliis obovatis revolutis integerrimis subtus punctatis.** Lin. Sp. Pl. 351. Whortle Berry with nodding Bunches of Flowers terminating the Branches, and oval Leaves which are entire, turned back, and punctured on their under Side. *Vitis Idæa foliis subrotundis non crenatis, baccis rubris.* C. B. P. 470. Red Whorts, or whortle Berries.

3. **VACCINIUM foliis ovatis mucronatis, floribus alaribus nutantibus.** Whortle Berries with oval pointed Leaves, and nodding Flowers proceeding from the Wings of the Stalks. *Vitis Idæa myrtinis foliis flosculis dependentibus.* Pluk. Phyt. Tab. 321. fig. 4. Whortle Berries with Myrtle Leaves, and small depending Flowers.

4. **VACCINIUM foliis integerrimis revolutis ovatis caulibus repentibus, filiformibus, hispidis.** Lin. Sp. Pl. 352. Whortle Berries with oval entire Leaves turning back, and a slender, creeping, bristly Stalk. *Vitis Idæa palustris Virginiana, fructu majore.* Raii. Hist. 685. Marsh Virginia Whorts with a larger Fruit.

5. **VACCINIUM foliis integerrimis revolutis ovatis, caulibus repentibus filiformibus nudis.** Lin. Sp. Pl. 351. Whortle Berries with oval, entire, reflexed Leaves, and naked, slender, creeping Stalks. *Oxycoccus seu vaccinia palustris.* J. B. 1. p. 525. Whortle Berries, Moss Berries, or Moor Berries; by some called Cranberries.

The 1st Sort grows very common upon large wild Heaths, in many Parts of England, but is never cultivated in Gardens, it being with great Difficulty transplanted, nor will it thrive long when it is removed thi-

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ther, for from many Trials which I have made, by taking up the Plants at different Seasons with Balls of Earth to their Roots, and planting them in Gardens, I could never succeed so as to preserve the Plants above 2 Years, and those never produced any Fruit, so that it is not worth the Trouble of cultivating.

The Fruit of this Sort is gathered by the poor Inhabitants of those Villages which are situated in the Neighbourhood of their Growth, and carried to the Market Towns. These are by some eaten with Cream or Milk; they are also put into Tarts, and much esteemed by the People in the North, but they are seldom brought to London. The Shrub, on which these grow, rises about 2 Feet high, having many Stems which are garnished with oblong Leaves, shaped like those of the Box Tree, but somewhat longer, and are a little sawed on their Edges. The Flowers are shaped like those of the *Arbutus*, or Strawberry Tree, of a greenish-white Colour, changing to a dark red toward the Top. The Fruit are about the Size of large Juniper Berries, and of a deep purple Colour, having a Flue upon them when they are untouched, like the blue Plums, which rubs off with handling.

The 2d Sort is of much humbler Growth, seldom rising above 6 or 8 Inches high. The Leaves of this Sort are so like that of the Dwarf Box, that, at a Distance, the Plants are often taken for it even by Persons of Skill. This is an ever-green Shrub, which grows on moory Ground in several Parts of the North, but it is full as difficult to transplant into Gardens, as the other Sort, though I have been assured by Persons of Credit, that they have seen this Sort planted to make Edgings to the Borders of the Gardens in Norway and Sweden, where the Plants may grow much better from the Cold of those Climates, than they will do in England, for this is a Native of very cold Countries. I have several times received Plants of this Sort from Greenland, by the Whale Ships. The Berries of this Sort are red and have a more agreeable acid Flavour than those of the first Sort. This Fruit is frequently used for Tarts in several of the northern Countries, where the Plants grow wild upon the Moors.

The 3d Sort grows naturally in Virginia and other Parts of North America; this has a low shrubby Stalk like the second. The Leaves are small, oval, pointed, and not unlike some Sorts of Myrtle; they continue green all the Year. The Flowers come out from the Wings of the Leaves at every Joint; their Foot Stalks are pretty long, and nod downward; they sustain but one Flower; they are small, white, and are succeeded by small red Berries which seldom ripen here.

The 4th Sort grows naturally in marshy Grounds

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in most Parts of *North America*. The Stalks of this are slender, imbricated, and trail on the Ground; the Scales are bristly; the Leaves are oval, entire, and their Edges turn backward; the Flowers come out from the Wings of the Stalk; they are of an herbaceous white Colour, and in their native Soil are succeeded by large red Berries, but in *England* the Fruit never comes to Perfection.

The Plants of this Sort are difficult to preserve in *England*, for they require a moorish boggy Soil which should be covered with Moss, and constantly kept wet, otherwise they will not thrive.

The 5th Sort produces long slender Branches, not bigger than Thread, which trail on the mossy Bogs, so are often hid by the Moss. These Branches are thinly garnished with small Leaves, about the Size and Shape of those of Thyme, having their upper Surface of a shining green Colour, but are white underneath. The Flowers are generally produced toward the Extremity of the Shoots, which are in Shape like those of the former Sorts, but are smaller, and of a red Colour; these grow on long slender Foot Stalks, and are succeeded by round, red, spotted Berries, of a sharp acid Flavour, which are much esteemed by the Inhabitants of the Places near the Bogs where they grow. Some use them for Tarts, and others eat them with Milk or Cream.

This Sort is a Native of Bogs, therefore cannot by any Art be propagated upon dry Land, but where there are natural Bogs, the Plants may be taken up carefully, preserving some of the Soil to their Roots, and transplanted into the Bogs in the Autumn; and if they are once fixed in the Place, they will spread and propagate themselves in great Plenty, and require no farther Care.

The 2 Sorts first mentioned also propagate very fast by their creeping Roots, so that when they are fixed in a proper Soil, they will soon overspread the Ground, for the Heaths, upon which they naturally grow, are generally covered with the Plants. The first Sort grows with the Heath, their Roots intermixing together, and frequently is found on sandy Heaths in divers Parts of *England*; but the second Sort grows only on moorish Land, where, by its creeping Roots, the Ground is soon covered with the Plants.

There are several other Species of this Genus, some of which are Natives of *Spain* and *Portugal*, others of *Germany* and *Hungary*, and several of the northern Parts of *America*, from whence those large Fruit are brought to *England*, which are used by the Pastrycooks of *London*, during the Winter Season, for Tarts; but as all these Sorts naturally grow on Swamps and Bogs, they are not easy to transplant into Gardens, so as to thrive, or produce Fruit, therefore there can be little Hopes of cultivating them to Advantage.

VALERIANA. *Tourn. Inst. R. H.* 131. *Tab.* 52. *Lin. Gen. Pl.* 43. Valerian.

The Characters are,

The Flower has a small Empalement; it has 1 tubulous Petal cut into 5 obtuse Segments at the Brim, with a gibbous Honey Gland on the Inside, it has three small, erect, All-shaped Stamina, the Length of the Petals, terminated by roundish Summits. The Germen is situated under the Flower, supporting a slender Style crowned by a thick

Stigma; it afterward turns to a crowned Capsule which falls off, in which is lodged a single Seed.

The Species are,

1. VALERIANA floribus triandris, foliis caulinis pinnatis, radicalibus indivisis. *Hort. Ups.* 13. Valerian with Flowers having 3 Stamina, winged Leaves to the Stalks, and those at the Root undivided. *Valeriana hortensis*. *Dod. Pempt.* 342. Garden Valerian.

2. VALERIANA floribus triandris, foliis omnibus pinnatis. *Hort. Cliff.* 15. Valerian with 3 Stamina to the Flowers, and all the Leaves winged. *Valeriana sylvestris major*. *C. B. P.* 164. Greater wild Valerian.

3. VALERIANA floribus monandris caudatis, foliis lanceolatis integerrimis. *Hort. Cliff.* 15. Valerian with Flowers having Tails, and one Stamina, and Spear-shaped entire Leaves. *Valeriana rubra*. *C. B. P.* 165. Red Talerian.

4. VALERIANA floribus monandris caudatis, foliis linearibus integerrimis. Valerian with tailed Flowers having 1 Stamina, and linear entire Leaves. *Valeriana rubra angustifolia*. *C. B. P.* 165. Narrow-leaved red Valerian.

5. VALERIANA floribus monandris, foliis pinnatifidis. *Hort. Upsal.* 14. Valerian with Flowers having 1 Stamina, and Wing-pointed Leaves. *Valeriana foliis calcitrapæ*. *C. B. P.* 164. Valerian with Leaves like those of the Star Thistle.

6. VALERIANA floribus triandris, foliis cordatis serratis petiolatis, summis ternatis. *Hort. Cliff.* 15. Valerian with 3 Stamina to the Flowers, and Heart-shaped sawed Leaves growing on Foot Stalks, and placed by Threes at the Top. *Valeriana maxima Pyrenaica, cacaliæ folio*. *Tourn. Inst. R. H.* 131. The largest Pyrenean Valerian with a foreign Colt's-foot Leaf.

7. VALERIANA floribus triandris, foliis ovato-oblongis obtusis integerrimis. *Lin. Mat. Med.* 23. Valerian with 3 Stamina to the Flowers, and oblong, oval, blunt, entire Leaves. *Nardus Celtica*. *J. B.* 3. p. 205. Celtick Nard.

8. VALERIANA floribus tetrandris æqualibus, foliis pinnatifidis, seminibus paleâ ovali adnatis. *Hort. Ups.* 13. Valerian with 4 equal Stamina to the Flowers, Wing-pointed Leaves, and Seeds fastened by an oval Husk. *Valeriana lutea humilis*. *Amman. Rutb.* 18. Low yellow Valerian.

9. VALERIANA caule dichotomo, foliis lanceolatis integris. *Vir. Cliff.* 5. Valerian with a Stalk which is divided into Pairs, and Spear-shaped entire Leaves. *Valeriana arvensis, præcox humilior, semine compresso*. *Mor. Umb.* 53. Corn Salad, or Lambs Lettuce.

10. VALERIANA caule dichotomo, foliis lanceolatis serratis, calycibus inflatis, *Hort. Cliff.* 16. Valerian with a Stalk branching in Pairs, Spear-shaped sawed Leaves, and swollen Empalements. *Valerianella Cretica, fructu vesicario*. *Tourn. Cor.* 6. Candia Lambs Lettuce with a Bladder Fruit.

11. VALERIANA caule dichotomo, foliis lanceolatis dentatis, fructu sexdentato. *Hort. Cliff.* 16. Valerian with a Stalk divided in Pairs, Spear-shaped indented Leaves, and a Fruit having 6 Indentures. *Valerianella femine stellato*. *C. B. P.* 165. Lambs Lettuce with a starry Fruit.

12. VALERIANA floribus diandris ringentibus, foliis ovatis.

ovatis sessilibus. Hort. Cliff. 15. Valerian with a ringent Flower, having 2 Stamina, and oval Leaves set close to the Stalk. *Valerianella cornucopoides, flore galeato. Mor. Umb.* Lambs Lettuce with a Helmet Flower like those of the *Cornucopia*.

There are several other Species of this Genus, some of which grow naturally in *England*, and others in different Parts of *Europe*; but, as they are seldom cultivated in Gardens, they are omitted, lest the Work should swell too much beyond its intended Bulk.

The 1st of these Sorts is propagated in *England* for medicinal Use, and is called in the Shops by the Name of Phu, to distinguish it from the Mountain Valerian, which is also used in Medicine, and is preferred to all the other Sorts by the modern Physicians, though the Roots of this first are still continued in some of the capital Medicines, and are by some esteemed equal in Virtue, if not superior, to the wild Sort.

This hath thick, fleshy, jointed Roots, which spread near the Surface of the Ground in a very irregular Manner, crossing each other, and matting together by their smaller Fibres; these have a very strong Scent, especially when dry. The lower Leaves, which rise immediately from the Root, are many of them entire; others are divided into 3, 5, or 7 obtuse Lobes; they are of a pale green Colour and smooth. The Stalks rise 3 or 4 Feet high; they are hollow, and send out Branches from their Sides by Pairs, and are garnished with winged Leaves, placed opposite at each Joint, which are composed of 4 or 5 Pair of long narrow Lobes terminated by an odd one. The Stalks, and also the Branches, are terminated by Flowers disposed in Form of an Umbel; they are small, tubulous, white, and cut slightly at the Brim into 5 Parts; these appear in *May* and *June*, and are succeeded by oblong flat Seeds having a downy Crown. It grows naturally in *Alsatia*, but has been long cultivated in our Gardens.

This Plant is propagated by parting its Roots, either in the Spring or Autumn, but the latter is much preferable to the former, which should be planted in Beds of fresh dry Earth about 2 Feet asunder, for the commonly spread and multiply very fast. If the Season is dry, you must water the Plants until they have taken Root; after which they will require no further Care, but to keep them clean from Weeds, and in Autumn, when their Leaves are decayed, the Roots should be taken up, and dried for Use.

The 2d Sort is generally found on dry chalky Soils, in shady Places, in divers Parts of *England*. The Roots of this, which grow wild on such Soils, are much preferable to those of the same Kind which are cultivated in Gardens, which is also the same of all the Sorts of aromatick Plants, when gathered from their native Places of Growth, where they are smaller, but have a stronger Flavour.

The Roots of this Plant are composed of long fleshy Fibres which are slender, and unite in Heads. All the Leaves of this Sort are winged; those at the Bottom are composed of broader Lobes than those on the Stalks, and are notched on their Edges; they are composed of 6 or 7 Pair of Lobes terminated by an odd one; these end in acute Points, and are hairy. The Stalks, in their natural Situation, seldom grow much more than

a Foot high, but, when the Roots are cultivated in a Garden, they grow more than twice that Height; these are channelled, hollow, hairy, and are garnished at each Joint with two winged Leaves placed opposite, whose Lobes are very narrow and almost entire. At the upper Part of the Stalk come out two small Side Branches opposite; these, and also the principal Stalk, are terminated by Clusters of Flowers, formed into a Kind of Umbel, which are shaped like those of the first Sort, but are smaller, and have a Tinge of purple on their Outside. It flowers about the same Time with the first Sort.

This Plant may also be propagated by parting the Roots either in Spring or Autumn, as was directed for the first Sort, but you should always observe to plant them upon a dry, fresh, undunged Soil, in which, though the Roots will not make near so great Progress as in a rich moist Soil, yet they will be much preferable to them for Use. These Roots should also be taken up, when the Leaves decay in Autumn, and preserved dry until used.

The 3d Sort grows naturally in rough stony Places in the South of *France*, and in *Italy*, but has been long cultivated in the *English* Gardens for Ornament.

The Roots of this Sort are ligneous, and as thick as a Man's Finger, spreading out on every Side very wide. The Stalks rise about 3 Feet high; they are round, smooth, of a grayish Colour, and hollow; these are garnished at each Joint with smooth Spear-shaped Leaves, near 3 Inches long and one broad, drawing to a Point at each End; they are generally placed by Pairs, but sometimes there are 3 at the same Joint standing round the Stalk. The upper Part of the Stalk sends out Branches by Pairs, which, with the principal Stalk, are terminated with red Flowers growing in Clusters, which have long Tubes, cut into 5 Parts at the Top, and from the Tube is sent out a Spur or Heel like the Flowers of Larkspur. It flowers most Part of Summer, and the Seeds ripen accordingly in Succession; these have a Down, by which they are transported to a good Distance.

There is a Variety of this with white Flowers, and one with pale Flesh-coloured Flowers, but they do not differ in any other Respect.

It is easily propagated by parting the Roots in Autumn, or by sowing the Seeds soon after they are ripe, in a shady Border, where the Plants will sometimes come up the same Autumn, especially if the Season proves moist, otherwise they will not appear till the following Spring. When these are fit to remove, they should be transplanted into Beds at about nine Inches or a Foot asunder, observing to water them till they have taken new Root; after which they will require no farther Care, but to keep them clear from Weeds, and in Autumn they must be transplanted where they are to remain.

These Plants grow large, therefore should have Room, so are not proper Furniture for small Gardens. When the Seeds of these Plants light on Joins of old Walls or Buildings, the Plants will come up, and thrive as well as in the Ground, and will continue much longer, so the Seeds may be scattered between the Stones of Grottos and such like Buildings, where the Plants will flower

flower from *May* till the Frost stops them, and will make a good Appearance.

The 4th Sort grows about *Montpelier*, and upon *Mount Baldus* in *Italy*. The Root of this is ligneous, but not so large as that of the former Sort; the Stalks rise 2 Feet high or better, and branch out on each Side from the Root to within 6 Inches of the Top; these are garnished with Leaves which are 3 or 4 Inches long, but are as narrow as those of Flax. The upper Part of the Stalk is naked, and terminated by a compact Cluster of bright red Flowers shaped like those of the former Sort, but smaller. This flowers about the same Time as the last, and may be propagated the same Way.

The 5th Sort grows naturally in *Spain* and *Portugal*; is an annual Plant which perishes soon after the Seeds are ripe. The lower Leaves, which spread on the Ground, are cut into many obtuse Segments; the Stalks, when the Plants are in good Ground, will rise near a Foot and a Half high, but on dry stony Soils not half so high, and when they grow out of the Joints of old Walls, not more than 3 Inches high; these are hollow, smooth, and round, sending out Branches by Pairs from the upper Joints; they are garnished with Wing-pointed Leaves, whose Lobes or Segments are very narrow. The Stalks and Branches are terminated by Tufts of Flowers shaped like those of the Garden Valerian, but smaller, and have a Flesh-coloured Tinge at the Top. The Seeds have a Down, which helps to spread them, so it propagates without Care.

The 6th Sort grows naturally on the *Pyrenean* Mountains; this has a fibrous perennial Root, from which come out many Heart-shaped Leaves standing on Foot Stalks more than a Foot in Length. The Leaves are 4 Inches over each Way; they are bluntly sawed on their Edges, of a bright green on their upper Side, and smooth, but their under Side is pale, and a little hairy. The Stalks rise 3 Feet high; they are hollow, channelled, and send out Branches opposite toward the Top, garnished with Leaves placed opposite, shaped like those below, but a little pointed, and frequently at the Top there are 3 Leaves placed round the Stalk, standing on short Foot Stalks. The Stalk and Branches are terminated by pale Flesh-coloured Flowers, disposed in Form of Umbels, which have very short Spurs or Heels. It flowers in *June*, and the Seeds ripen in *August*, which are crowned with Down, whereby they are transported to a Distance.

This Plant delights in Shade and a moist Soil; it may be propagated by sowing the Seeds on a shady Border, soon after they are ripe, and when the Plants come up, they should be treated as the third Sort.

The 7th Sort grows naturally on the *Alps* and *Styrian* Mountains; this was sent me by Dr. *Allione* from *Turin*, who gathered it on the *Alps* near that Place; it is a very humble Plant. The Stalks trail on the Ground among the Moss, and put out Roots at their Joints, which swell into Knobs or Tubers. The Leaves are oblong, oval, and entire; the Flower Stalks rise 3 or 4 Inches high, and are garnished with 2 or 3 Pair of small oval Leaves; the Flowers are small, of a pale incarnate Colour, and are formed in a loose Spike sitting very close to the Stalk. It flowers in *June*, but does not produce Seeds here.

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This Plant is difficult to preserve in Gardens, for it naturally grows on rocky Mountains, which are covered with Moss, where the Snow continues six or seven Months, so it requires a very cold Situation, and a stony Soil.

The 8th Sort grows naturally in *Siberia*; this is a biennial Plant which flowers and produces Seeds the second Year, and then decays. The Leaves of this are winged; the Lobes of the lower Leaves are oblong, oval, and end in roundish Points; the Stalks rise a Foot high, and are garnished with Leaves, composed of 4 or 5 Pair of Lobes, terminated by a broad one cut into 3 or 5 Points. The Lobes of these are acute-pointed; these Leaves are placed by Pairs, and sit close to the Stalks; they are smooth, and of a pale yellowish Colour. The upper Part of the Stalk has two Pair of Branches; the lower Pair are near 3 Inches long, but the upper are not half that Length; these, and also the principal Stalk, are terminated by bright yellow Flowers, collected in a Sort of Umbel, which are shaped like those of the first Sort. It flowers in *July*, and the Seeds ripen in *Autumn*; it is propagated by Seeds, which should be sown where the Plants are to remain; this may be performed either in *Autumn*, soon after they are ripe, or in the Spring; they have succeeded with me equally at both Seasons. When the Plants come up, they must be thinned where too close, and kept clean from Weeds, which is all the Culture they require.

The 9th Sort is the common Corn Salad which is cultivated in Gardens, but is found growing naturally on arable Land among the Corn, in many Parts of *England*; this is an annual Plant which dies when it has perfected its Seeds. The lower Leaves of this are oblong, and broad at their Points, which are rounded, and narrowed at their Base, where they embrace each other; these are from three Quarters of an Inch to 2 Inches long, in Proportion to the Goodness of the Ground. From between the Leaves arises an angular Stalk, from 3 to 8 or 9 Inches high, which divides into 2 Branches which spread from each other, and these both divide again into 2 other in like Manner. The Stalks are garnished with Leaves shaped like those at the Bottom, but smaller; these are placed by Pairs at each Joint. The Branches are terminated by Clusters of white Flowers, shaped like those of the other Species, which are succeeded by pretty large roundish Seeds a little compressed on one Side. It flowers in *June*, and the Seeds ripen in *August*, which are very apt to drop before they have changed Colour.

It is propagated as a Salad Herb for the Spring, but, having a strong Taste which is not agreeable to many Palates, it is not so much in Use as it was formerly; it is propagated by Seeds, which should be sown in *Autumn* on the Spot where they are to grow for Use. If they are sown the latter End of *August*, the first Rains will bring up the Plants; these should be hoed to thin them where they are too close, and to destroy the Weeds. Early in the Spring the Plants will be fit for Use. The younger the Plants are when used, the less strong will be their Taste, so they may supply the Table in a Scarcity of other Herbs. When the Seeds of this Sort are sown in the Spring, if the Season proves

dry, the Plants will not appear till Autumn or the Spring following; besides, in Summer the Herb is not so fit for Use. I have known the Seeds of this Plant lie in the Ground many Years, when they have happened to be buried deep, and upon being turned up to the Air, the Plants have come up as thick as if the Seeds had been newly sown.

There are two other Species of this which grow naturally in England, but as they are seldom admitted into Gardens, I have not enumerated them; these are by some supposed to be only accidental Varieties, but I have sown them all several Years, and have never found either of them alter.

The 10th Sort grows naturally in Candia; this is an annual Plant, whose Stalks rise 6 or 8 Inches high, and divide by Pairs like the former. The Leaves are much narrower than those of the former, end in acute Points, and are sawed on their Edges; the Flowers are like those of the former Sort, but have a swollen Bladder Empalement which encloses the Seeds.

The 11th Sort grows naturally in Italy. The Leaves at Bottom are 3 or 4 Inches long, round-pointed, and deeply notched on their Edges; the Stalk rises near a Foot high, sending out Branches by Pairs from the Joints below; the upper Part divides by Pairs in the same Manner as the two former. The Flowers are collected in globular Heads; they are of an herbaceous white Colour, and are succeeded by starry Fruit having 6 Indentures. It flowers in June, and the Seeds ripen in August; this and the former Sort are supposed to be only Varieties arising from the same Seeds, but I have sown them more than 30 Years, and have not observed either of them vary.

The 12th Sort grows naturally in the arable Fields in Sicily and Spain; this is an annual Plant. The Stalks are pretty thick, channelled, and of a purplish Colour, they rise 8 or 9 Inches, and are garnished with oval smooth Leaves placed by Pairs at each Joint, sitting close to the Stalks; they are an Inch and a Half long, and an Inch broad, of a lucid green. From each side of the Stalk spring out slender Branches, but the upper Part divides into 2 spreading Branches like the other. The Joints are swelling, and these Branches divide again by Pairs; these are terminated by Clusters of red Flowers, shaped like those of the red Valerian, but larger; they have 2 Leaves close under the Bunches, embracing the Stalks with their Base. When the Flowers are past, the Fruit stretches out in Shape of a Cornucopia or Horn of Plenty. The Flowers appear in June, and the Seeds ripen in Autumn.

These 3 Sorts are propagated by Seeds, which should be sown in Autumn where the Plants are to remain. When these come up, they will require no other Culture but to thin them where they are too close, and keep them clean from Weeds. The Plants, which rise in Autumn, will live through the Winter, and come early to flower the following Summer, so will produce good Seeds, whereas those, which rise in the Spring, do not ripen their Seeds unless the Season proves warm.

VALERIANA GRÆCA. See Polemonium.

VALERIANELLA. See Valeriana.

VANILLA. Plum. Gen. Nov. 25. Tab. 28. Epidendrum. Lin. Gen. 907.

The Characters are,

It has a single Stalk. The Flowers are included in Sheaths, distant from each other; they sit on the Germen and have no Empalement; they have 5 oblong Petals which spread open very wide, and turbinated Nectaria, whose Bases are tubulous, situated on the back Side of the Petals in the Middle; their Brims are oblique and bifid; the upper Lip is short and trifid; the under one runs out in a long Point; they have two very short Stamina sitting upon the Pointal, and the Summits are fastened to the Upper Lip of the Nectarium; they have a long, slender, contorted Germen, situated under the flower, supporting a short Style fastened to the upper Lip of the Nectarium, crowned by an obsolete Stigma. The Germen afterwards becomes a long, taper, fleshy Pod, including many small Seeds.

The Species are,

1. VANILLA foliis-oblongo-ovatis mucronatis, nervosis, floribus alternis. Vanilla with oblong, oval, acute-pointed, veined Leaves, and Flowers growing alternately. Volubilis filiquosa Mexicana, plantaginis folio Catesb. Car. 3. p. 7. Mexican Climber having Pods, and a Plantain Leaf.

2. VANILLA foliis oblongis obtusis, compressis articulatis, floribus alaribus. Vanilla with oblong, blunt, compressed, jointed Leaves, and Flowers proceeding from the Sides of the Stalks.

The 1st Sort is that which the Spaniards cultivate in the West-Indies, which we shall describe hereafter.

The 2d Sort was sent me from Carthage in New-Spain, where it grows naturally; this has a climbing Stalk, which sends out Roots from the Joints, which fasten to the Stems of Trees or any neighbouring Support, and climb to a great Height. The Leaves, which come out singly at each Joint, are oblong, smooth, and jointed. The Flowers come out from the Side of the Branches; they are shaped like those of the great Bee Orchis, but are longer: The Galea or Helmet of the Flower is of a pale Pink Colour, and the Labia is purple. This Plant flowered in the Chelsea Garden, but wanting its proper Support, it lived but one Year.

There are 2 or 3 Varieties of the first Sort, which differ in the Colour of their Flowers, and the Length of their Pods; and there are many other Species which grow naturally in both the Indies, which have been brought to this Genus, but those abovementioned are all I have seen growing.

The Plant, which produces the Fruit called Vanilla or Banilla, by the Spaniards, hath a trailing Stem, somewhat like common Ivy but not so woody, which fastens itself to whatever Tree grows near it, by small Fibres or Roots which are produced at every Joint, which fasten to the Bark of the Tree, and by which the Plants are often nourished, when they are cut or broken off from the Root a considerable Height from the Ground, in like Manner as the Ivy is often seen in England. The Leaves are as large as those of the common Laurel, but are not quite so thick; these are produced alternately at every Joint (which are six or seven Inches asunder), and are of a lively green Colour on the upper Side, but of a paler green underneath. The Stems of these Plants shoot into many Branches, which fasten themselves also to the Branches of the Trees, by which

Means

Means they rise 18 or 20 Feet high, and spread quite over some of the smaller Trees, to which they are joined. The Flowers are of a greenish yellow Colour, mixed with white, which, when fallen, are succeeded by the Fruit, which are 6 or 7 Inches long.

This Sort, which is manufactured, grows not only in the Bay of *Campeachy*, but also at *Cartagena*, at the *Caraccas*, *Honduras*, *Darien*, and *Cayan*, at all which Places, the Fruit is gathered and preserved, but is rarely found in any of the *English* Settlements in *America*, though it might be easily carried thither, and propagated; for the Shoots of these Plant are full of Juice, so may be easily transported, because they will continue fresh out of the Ground for several Months. I had some Branches of this Plant, which were gathered by Mr. Robert Millar at *Campeachy*, and sent over between Papers by way of Sample; these had been at least six Months gathered, when I received them, and upon opening the Papers, I found the Leaves rotten, with the Moisture contained in them, and the Paper was also perished with it, but the Stems appeared fresh, upon which I planted some of them in small Pots, and plunged them into a hot Bed of Tanners Bark, where they soon put out Leaves, and sent forth Roots from their Joints; but, as these Plants naturally fasten themselves to the Stems of the Trees, in the Woods where they grow naturally, it is with great Difficulty that they are kept alive, when they have not the same Support; therefore, whoever would preserve any of these Plants in *Europe*, should plant them in Tubs of Earth, near the Stem of some vigorous *American* Tree, which requires a Stove, and can bear a great deal of Water, because the *Vanillas* must be plentifully watered in the Summer Season, otherwise they will not thrive. They require also to be shaded from the Sun by Trees, so that if these are planted at the Foot of the *Hernandia*, or *Jack-in-a-Box*, whose Leaves are very large, and afford a good Shade, they will succeed better than when they are exposed in single Pots alone; and as these Plants require the same Degree of Heat in Winter, they will agree well together.

When these Plants are designed for Propagation in the warm Parts of *America*, there is nothing more required than to make Cuttings of about three or four Joints in Length, which should be planted close to the Stems of Trees, in low marshy Places; and to keep down other troublesome Plants; which if permitted to grow about the Cuttings before they are well rooted, would overbear and destroy them; but after they are established, and have fastened their Shoots to the Stems of the Trees, they are not in much Danger of being injured by neighbouring Plants, though, when the Ground is kept clear from Weeds, the Plants will be much better nourished.

These Plants do not produce Flowers until they are grown strong, so that the Inhabitants affirm, That it is 6 or 7 Years from the planting to the Time of their bearing Fruit; but when they begin to flower and fruit, they continue for several Years bearing, and this without any Culture, and as it is a Commodity which bears a good Price, it is well worth cultivating in several of the *English* Settlements, especially as they will grow on moist woody Places, where the Land is not cleared from Timber.

The Method used to prepare the Fruit, is, when it turns of a yellow Colour, and begins to open, to gather it, and lay it in small Heaps to ferment two or three Days, in the same Manner as is practised for the Cocoa or Chocolate Pods; then they spread them in the Sun to dry, and when they are about half dried, they flat them with their Hands, and afterwards rub them over with the Oil of *Palma Christi*, or of the Cocoa; then they expose them to the Sun again to dry, and afterward they rub them over with Oil a second Time; then they put them in small Bundles, covering them with the Leaves of the *Indian* Reed, to preserve them.

These Plants produce but one Crop of Fruit in a Year, which is commonly ripe in *May*, fit for gathering, for they do not let them remain on the Plants to be perfectly mature, because then they are not so fit for Use; but when they are about half changed yellow, they esteem them better for keeping, than when they are changed to a dark brown Colour, at which Time the Fruit splits, and shews a great Quantity of small Seeds, which are inclosed within it. While the Fruit is green, it affords no remarkable Scent, but as it ripens, it emits a most grateful aromack Odour. When the Fruit begins to open, the Birds attack them and devour all the seeds very greedily, but do not eat any other Part of the Fruit.

The Fruit, which are brought to *Europe*, are of a dark brown Colour, about 6 Inches long, and scarce an Inch broad; they are wrinkled on the Outside, and full of a vast Number of black Seeds, like Grains of Sands, of a pleasant Smell, like Balm of *Peru*.

The Fruit is only used in *England*, as an Ingredient in Chocolate, to which it gives a pleasant Flavour to some Palates, but to others it is very disagreeable; but the *Spanish* Physicians in *America* use it in Medicine, and esteem it grateful to the Stomach and Brain, for expelling Wind, to provoke Urine, to resist Poison, and cure the Bite of venomous Animals.

As this Plant is so easily propagated by Cuttings, it is very strange that the Inhabitants of *America* should neglect to cultivate it, especially as it is an Ingredient in their Chocolate, which is so much drank all over *America*; but, as the *English* have in a Manner quite neglected the Culture of the Cocoa, it is no Wonder they should neglect this, since the former was cultivated in great Plenty by the *Spaniards* in *Jamaica*, while that Island remained in their Possession, so that the *English* had an Example before them, if they would have followed it; whereas the *Vanilla* was not found growing there, and therefore it is not to be supposed, that the Persons, who were so indolent as to quit the Culture of many valuable Plants then growing on the Spot, should be at the Trouble of introducing any new ones.

VAPOURS are defined by Naturalists to be those watery Particles which are severed from others by the Motion of the Air, and are carried about in it several Ways according as the Wind, or Warmness of the Air, serves; they rise out of the Sea, Rivers, Lakes, and other Waters.

As to their hanging in the Air, we may observe, in a hot Day, when there is no Wind stirring, such a Company of Vapours to rise out of moist Ground, as make thick Fogs, which are sometimes higher, and

sometimes lower, as the Multitude and Motion of the the Vapours happen to be. They are to be seen as well upon high Grounds as low.

They are easily dissipated by the Wind, and particularly if it be a drying Wind.

The Sun has the same Effect upon them, and we commonly see, when there are thick Fogs about Sun-rising, they disappear a little after it is up.

It is evident that Fogs consist of aqueous Particles rarefied, because they mightily bedew every thing that lies open to them. These Particles, being soundly moved, must needs fly aloft into the Air, but if their Motion be something faint, they play about the Surface of the Earth; for this is agreeable to the Laws of Motion, that such Things as are about the Globe of the Earth, the more they are moved, the more they recede from the Centre of the Earth.

Again, these Fogs arise out of all Places, mountainous or champain, and continue till they are dispelled by Wind or Heat, but they continue longest in the lowest Grounds, because those Places are fullest of Moisture, and are not so much exposed to the Winds; but wherever they be, when the Wind rises upon them, they are dissipated, and driven about, till we see no more of them.

So, in like Manner, the Heat of the Sun, by putting them into a brisker Motion, either dissipates them by Rarefaction, or raises them higher, and forms them into Clouds.

And whereas sometimes the Fogs stink; it is not because they come from stinking Water, but because the Vapours are mixed with sulphureous Exhalations, which smell so. Perhaps these Exhalations would fly up directly to the Clouds, if there were no Fogs to hold them, and so would not affect the Sense of Smelling; but when they are once entangled and blended with the Fog, they last as long as that does.

The Clouds are higher than the Fogs; they hang in the Air, and are carried about in it by the Winds. The Clouds are of various Figures, and sometimes so thin, that the Rays of the Sun pass through them, but at other Times they are thick enough to intercept and obstruct them; they also appear of several Colours, as white, red, and sometimes very dark.

The Thickness of the Clouds proceeds from the Closeness of the vaporous Particles one to another, and their Thinness from the Distance of those Particles, one from another, of which there are several Causes. When they are very thin, they leave so many Interstices, that the Rays of the Sun dart through them in many Places but are intercepted in others.

As to the Variety of the Figures of the Clouds, they arise from their Plenty of Vapours, and the Influence of the Sun and Wind, for they cannot be variously condensed, rarefied, and carried about in the Air, but their Figure must needs be changed.

To account for the Clouds hanging in the Air is a Matter of some Difficulty.

All the watery Particles, of which they consist, are heavier than Air; and so, if there were nothing to hinder them, they would fall to the Earth; but there are two things which seem to keep them up.

1. The Winds which blow from all Parts, under the

Region of the Clouds, and bear about with them many lighter Sorts of Bodies; especially if those Bodies contain but a small Quantity of solid Matter under a broad Superficies. And thus it is visible, how easily Paper Kites are kept up by the Wind, when they are mounted pretty high; and so the Particles of Water, pretty much rarified, may easily be suspended at that Height.

2. New Exhalations and Vapours are perpetually fuming out of the Earth; and by their moving upwards, prevent the Clouds from descending, unless the Density of the Clouds overweighs them. Thus we see the Vapour of Fire carries lighter Bodies up the Chimney; and Smoke can turn a thin Plate of Iron, artfully placed in it, so strongly, as to turn about a Spit, and roast Meat.

It is a question among Naturalists, Whether Clouds and thicker Fogs are composed alike; or, Whether there be something more in the Clouds?

Some think that Clouds are grosser than all Fogs, and that they are composed of Flakes of Snow, rather than Particles of Water, such as make Fogs.

Others say, It is enough to consider Clouds as a closer Sort of Fogs, and indeed the Fogs, that hang upon the Tops of very high Hills, appear to People in the Plains to be all one with Clouds, though those, that are at them, perceive nothing but a thick Fog.

There being always many Vapours in the Air, though not always visible, it comes to pass that great Dews fall even in clear Weather, and especially in those Countries where it seldom rains; for when it happens that the scattered Vapours are collected and condensed together, and forced downwards, they must needs fall, and bedew Plants and Grass.

The Time for the falling of the Dew is either before the Rising of the Sun, or after the Setting of it, but in order to its falling regularly at those Times, it is necessary that the Air be calm, for windy or stormy Weather hinders it; but when the Weather is calm, and gentle Breezes are felt from the West about the Time that the Sun sets, and from the East about the Rising of it, it is probable they collect the Vapours, and precipitate them, by moderately cooling the Air, and because the Morning Breezes are more general than the Evening ones, therefore the Evening Dews fall only here and there, but the Morning ones seldom fail of being universal.

It is likewise found by Experience, That the Dews are more copious in hotter Countries than in cold, the Reason of which seems to be this; That the Heat of the Sun does, in the Day Time, raise abundance of Vapours out of the Water, which Vapours are so extremely rarefied by the same Heat, that they are dispersed far and wide, but the cool of the Night brings them together again, and condenses them to that Degree, that they fall to the Ground, but not in such large Drops as Rain does.

But in colder Countries, where there are frequent Rains, and the Vapours are less rarefied, most of them come down in Rain, and but a small Part turns to Dew.

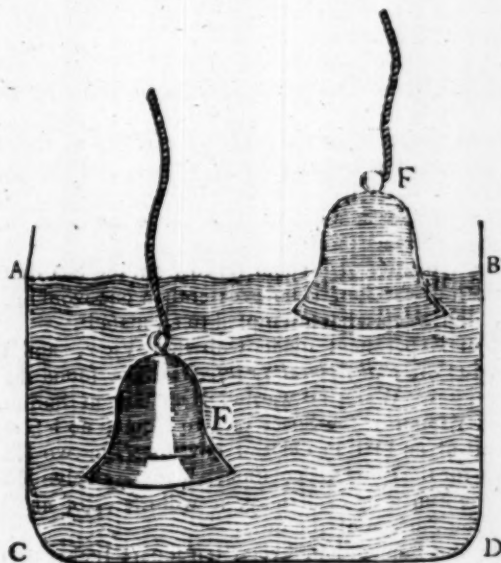
A certain Author says, that in some of the hotter Climates, the Earth is without Rain for six or seven Months together; and is every Summer Season so much parched and dried, that there is hardly any Moisture

Moisture to be found in it for three or four Feet deep ; and during that Time the Heats are so excessive, that without the refreshing Dews of the Nights (which are there very considerable) they Plants must inevitably perish ; for there is no Moisture they can have, but from the Dews, and yet that Moisture supports the Trees and Plants in a flourishing State. Toward the End of the Day the Leaves contract themselves, by Reason of the excessive Heat of the Sun ; but by the falling of the Dews at Night, they expand and open themselves ; so that in the Morning and fore Part of the Day they have a most agreeable Verdure ; and also this Moisture of the Dews affords sufficient Nourishment to the Plants to bring the Fruits to perfection.

By a great many Observations made by Mr. Henry Beighton, F. R. S. and Dr. J. T. Desaguliers, to raise Water by Fire ; according to Mr. Newcome's Improvement of it, they found that the Water by boiling, was expanded 14,000 Times, to generate Steam as strong (*i. e.* as elastick) as common Air, which therefore must be near 16½ Times specifically lighter.

And it is plain, that this Steam is not made of the Air extricated out of the Water, because it is condensed again into Water by a Jet of cold Water spouting into it ; and the little Quantity of Air that comes out of the injected Water must be discharged at every Stroke, otherwise the Engine will not work well.

E X P E R I M E N T.



A B C D represent a pretty large Vessel of Water, which must be set on the Fire to boil. In this Vessel must be suspended the Glass Bell E, made heavy enough to sink in Water, but put in, in such a Manner, that it be filled with Water when upright, without any Bubbles of Air at its Crown within, the Crown being all under Water.

As the Water boils, the Bell will by Degrees be emptied of its Water, being pressed down by the Steam which rises above the Water in the Bell ; but as that Steam has the Appearance of Air, in order to know

whether it be Air or not, take the Vessel off the Fire, and draw up the Bell by a String fastened to its Knob or Top, then, as the Steam condenses by the cold Air on the Outside of the Bell, the Water will rise up into the Bell at F, quite to the Top, without any Bubble above it ; which shews that the Steam that kept out the Water was not Air.

N. B. *This Experiment succeeds best when the Water has been first purged of Air, by boiling and the Air Pump.*

We know, by several Experiments made on the Fire Engine, (in Capt. Savary's Way, where the Steam is made to press immediately on the Water), that Steam will drive away Air, and that in Proportion to its Heat, though in the open Air it floats and rises in it like Smoke.

Now if the Particles of Water turned into Steam or Vapour repel each other strongly, and repel Air more than they repel each other, Aggregates of such Particles made of Vapour and Vacuity may rise in Air of different Densities, according to their own Density, dependent on their Degree of Heat, without having Recourse to imaginary Bubbles, formed in a Manner only supposed, and not proved.

Indeed he owns, that if the watry Particles had no repellent force, they must precipitate in the same Manner that Dust will do after it has been raised up ; but there are too many Observations and Experiments, to leave any Doubt of the Existence of repellent Force abovementioned.

And that he cannot shew by any Experiment, how big the Molecules of Vapour must be which will exclude Air from their Interstices ; nor that these Molecules do vary in Proportion to the Degree of Heat by an Increase of repellent Force in each watry Particle, or by a farther Division of the Particles still less ; but in the general we may reasonably affirm, that the Rarity of the Vapour is proportionable to the Degree of its Heat, as it happens in other Fluids. (See Philos. Trans. N° 270). And though the Different Degrees of the Air's Rarefaction are also proportionable to the Heat, yet the same Degree of Heat, rarefies Vapour much more than Air.

Now to shew that what has been said will account for the Rise of Vapours, and Formation of Clouds, we must only consider whether that Degree of Heat which is known to rarefy Water 14,000 Times, being compared with several of those Degrees of Heat in Summer, Autumn, and Winter, which are capable of raising Exhalations from Water or Ice (the Rarity of the Vapours being considered) will appear to be such, that the Vapour will rise high enough in Winter, but not too high in Summer, to agree with the known Phenomena.

That the Effects are adequate to the Causes in this Case, he thinks may be made out in the following Manner ; *viz.*

The Heat of boiling Water, according to Sir Isaac Newton's Table (*Philosopb. Transact.* N° 273). is 34, the mean Heat of Summer 5, the mean Heat of Spring or Autumn 3, and the least Degree of Heat, at which Vapours rise in Winter (*alias* the mean Heat of Winter) is 2.

The Rarity of Vapour proportionable to these four Degrees of Heat is 24000, 2058, 1235, and 823.

The

V A R

The Rarity of Air is in Summer 900, in Spring or Autumn 850, and in Winter 800.

The Density of Water, compared with the abovementioned Densities, being inversely as one to the abovementioned four Numbers.

The Height above the Earth to which the Vapours will arise, and at which they will be in *Equilibrium*, in an Air of the same Density with themselves, will vary according to the Rarity of the Vapour depending on the Heat of the Season.

For the Vapour which is raised by the Winter's Heat, expressed by the Number 2, when the Rarity of the Air, is 800, will rise to (and settle at) an Height of about the sixth Part of a Mile, when the Barometer is above thirty Inches high.

But if the Heat be greater, then the Vapours will rise higher; and pretty much higher if the Sun shines, though in frosty Weather, the Barometer then being very high.

If the Barometer falls, and thereby brings the Place of *Equilibrium* (for Vapours raised by the Heat 2) nearer the Earth, then also will the Heat be increased, the Vapour more rarefied, and consequently the new Place of *Equilibrium* sufficiently high.

It is to be observed, that in Winter when the Heat is only equal to 2, the Air is denser close to the Earth, which has not any Heat sufficient to rarefy it near the Ground, as happens in warm Weather; therefore the Vapour will rise gradually in an Air whose Density decreases continually from the Earth upwards, neither will the Vapour be hindered of its full rise by any Condensation from a greater Cold of the ambient Air; the Air being then as cold next to the Ground, where the Vapour begins to rise, as it is any Height from the Earth.

The Vapour which is raised by the Heat of the Spring or Autumn, expressed by Number 3, will rise to the Height of $3\frac{1}{2}$ Miles when the Barometer is at 30 and the Rarity of the Air is 850. But then as the Air is hotter near the Ground than at the Height of Half a Mile or a Mile, the Vapour will condense as it rises; and as the Air when the Earth is heated, is rather near the Ground than at some Height from it, the Place for *Equilibrium* will, upon these two Accounts, be brought much lower than otherwise it would be; as for Example, to the Height of about a Mile; which will agree with Phænomena.

In Summer the two Causes abovementioned increasing, the Vapour raised by the Heat 5 (whose Place of *Equilibrium* would be $5\frac{1}{2}$ Miles high, if the Vapour, after it began to rise, was not condensed by cooling, and the Air was denser close to the Earth) will settle at the Height of about $1\frac{1}{2}$, or 2 Miles; which is also agreeable to Phænomena.

Lastly as the Density and Rarity of the Vapour is chiefly owing to its Degree of Heat, and in a small Measure to the increased or diminished Pressure of the circumambient Air, when it is not confined; and the Density and Rarity of the Air is chiefly owing to the increased or diminished Pressure, by the Accumulation or Exhaustion of superiour Air, whilst Heat and Cold alter its Density in much less Proportion; the Clouds made of the Vapours abovementioned, instead of con-

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forming themselves to the altered Density of the ambient Air, will rise when it is condensed, and sink when it is rarefied; and also rise or sink, when the Pressure of the Air is not altered, and its Density very little changed, by their own Dilatation, owing to Heat and Cold, as may be often observed by seeing them change their Height considerably, whilst the Barometer continues exactly at the same Degree, and the Liquor of the Thermometer rises or falls very little, and sometimes not at all.

As for the Manner how Clouds are changed into Rain, it has been hinted at the Beginning of this Article, but for farther Satisfaction let the Reader have Recourse to Dr. Halley's Account of it in the *Philosoph. Transact.* N^o 183. which Dr. Desaguliers says he has always found agreeable to the Phænomena.

He adds, that since he had for Brevity's sake, only mentioned at what Heights from the Surface of the Earth Vapours of different Densities will come to an *Equilibrium*, without giving a Reason for settling the Place of *Equilibrium*, at whose Heights he thought it proper here to give the Method by which they may be found; viz.

As the Vapours will settle and rise where the Air is of the same Density with themselves, it is only required to find the Density of the Air at any Distance from the Earth at several Heights of the Barometer, which may be deduced from Dr. Halley's two Tables, *Philosoph. Transact.* N^o 386. (the first shewing the Altitudes to given Heights of the Mercury, and the second the Heights of the Mercury again at given Altitudes), and knowing the Degree of Heat by the Thermometer, because the Density of the Vapour depends upon the Degree of Heat of the Season, provided that proper Allowances be made for the great Rarefaction of the Air near the Earth in hot and dry Weather, and the Condensation of the Vapours in their Rise, by reason of the Air being colder at a little Height above the Earth than just at the Surface of it.

The Quantity of Vapour raised from the Sea by the Warmth of the Sun, is far greater than one would imagine. Dr. Halley has attempted to estimate it.

In an Experiment made with that View, and described in the *Philosophical Transactions*, he found that a Quantity of Water no warmer than Air in Summer, lost in Vapour in the Space of two Hours, no less than $\frac{1}{33}$ Part of an Inch in Depth: now for $\frac{1}{33}$ in two Hours taking for the easier Calculation, $\frac{1}{66}$ in the twelve Hours that the Sun is up each Day, it will rise $\frac{1}{66}$ of an Inch from the Surface of the Sea.

On this Supposition, every ten square Inches of the Surface of the Water yield in Vapour *per Diem*, a cubick Inch of Water of four Feet square, a Gallon; a Mile square, 6914 Tons; a square Degree supposed of 60 *English* Miles, will evaporate 33 Millions of Tons, and if the *Mediterranean* Sea be estimated at 410 Degrees long, and four broad, Allowances being made for the Places where it is broader, by those where it is narrower, there will be 160 square Degrees of Sea, and consequently the whole *Mediterranean* must lose in Vapour in a Summer's Day, at least 5280 Millions of Tons.

VARIEGATED signifies streaked or diversified with several Colours; of which there are now a great Variety

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Variety of Plants in the Gardens of the Curious, whose Leaves are variegated with yellow or white. Those which are spotted with either of these Colours in the Middle of their Leaves, are called Blotched (in the Gardeners Term); but those whose Leaves are edged with these Colours are called Striped Plants. Those Plants whose Leaves are blotched are generally subject to become plain, when planted in a good Soil; or at least in the growing Season, will have but a small Appearance of the two Colours; but those which have edged Leaves rarely become plain again, especially if the Edging is broad, and goes quite through the Leaves, though these do not appear so finely variegated in the growing Season, as they do the other Parts of the Year.

All the different Sorts of Variegation in Plants were at first accidental, being no more than a Distemper in the Plant, which being observed, has been cherished by impoverishing the Soil in which they grow; by which Method their Stripes are rendered more lasting and beautiful. But whatever some Persons have affirmed of stripping Plants by Art, I could never observe it done by any, unless in woody Shrubs and Trees, which may be variegated by putting in a Bud or Graft taken from a variegated Plant; where, although the Buds should not grow, yet if they keep fresh but eight or ten Days, they will many Times communicate their gilded *Miasma* to the Sap of the Trees into which they were budded; so that in a short Time after, it has appeared very visible in the next adjoining Leaves, and has been afterwards spread over the greatest Part of the Tree; but in such Plants as are herbaceous, where this Operation cannot be performed, there is no Way yet ascertained whereby this stripping can be effected by Art.

In some Sorts of Plants this Distemper is often communicated to the Seeds; so that from the Seeds gathered from variegated Plants, there will constantly be some variegated Plants produced; as in the striped Wing Pea, the greater Maple, &c. therefore these may be constantly propagated that Way.

That this stripping proceeds from the Weakness of Plants is very evident, since it is always observed that whenever Plants alter thus in the Colour of their Leaves, they do not grow so large as before, nor are they so capable to endure the Cold; so that many Sorts of Plants which are hardy enough to endure the Cold of our Climate in the open Air, when in their natural Verdure require to be sheltered in the Winter, after they are become variegated, and are seldom of so long continuance, which is a plain Proof that it is a Distemper in the Plants, since whenever they become vigorous, this Stripping is either rendered less visible, or entirely thrown off; especially, (as was observed) if the Plants are only blotched, or if the Edging be of a yellow Colour, it is less apt to remain than when it is white; which is esteemed the most beautiful Stripping, and which (when once thoroughly established) is hardly ever to be got out of the Plants again, so as to render the Leaves entirely green.

Nay, such is the Venom of this morbid Matter, that it not only tinges the Leaves, but also the Bark and Fruit of Trees are infected by it; as in the Orange

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Pear, &c. whose Bark and Fruit are striped in the same Manner as their Leaves.

The different Colours which appear in Flowers also proceed from the same Cause, though it is generally in a less Degree in them than when the Leaves and Branches are infected; for the various Colours, which we see in the same Flowers, are occasioned by the Separation of the nutritive Juice of Plants, or from the Alteration of their Parts; whereby the smaller Corpuscles, which are carried to the Surfaces of the Flower Leaves, are of different Forms, and thereby reflect the Rays of Light in different Proportions.

VASCULIFEROUS PLANTS are such whose Seeds are contained in Vessels, which are sometimes divided; and these have always a monopetalous Flower, either uniform or difform.

VASES: A Vase is a Sort of a Flower Pot to set in a Garden.

VEGETABLE, a Term applied to all Plants, considered as capable of Growth; *i. e.* to all natural Bodies, which have Parts organically formed for Generation and Accreation, but not for Sensation.

Dr. Boerhaave defines a Vegetable to be a Body generated of the Earth, to which it adheres, and is connected by Parts called Roots, through which it receives the Matter of its Nourishment and Increase, and consists of Juices and Vessels sensibly distinct from each other, or, a Vegetable is an organical Body composed of Vessels and Juices every-where distinguishable from each other, to which the Roots grow, or Parts by which it adheres to some other Body, from which it derives the Matter of its Life and Growth.

This Definition of a Vegetable is very scientifick, and furnishes us with a just and adequate Idea of it; for by its consisting of Vessels and Juices, it is distinguished from a Fossil; and by its adhering to another Body, and deriving its Nourishment therefrom, it is distinguished from an Animal.

He defines a Vegetable an organical Body; because it consists of different Parts, which jointly concur to the Exercise of the same Function.

The Definition of its adhering by some of its Parts to another Body is very proper; for we know of no Plant that is so absolutely vage and fluctuating, but has still a Body it adheres to, though that Body may be various; *e. g.* Earth, as in our common Plants; Stone, as in Rock Plants; Water, as in Sea Plants; Air, as in some Mucilages.

As to those few Plants that appear to float with the Water, their Manner of Growth is somewhat anomalous. Monsieur Tournefort has shewn, That all Plants do not arise strictly from Seeds; but that some, instead of *Semen*, deposit or let fall a drop of Juice, which sinking in the Water by its Gravity, reaches the Bottom, or some Rock, &c. in its Way, to which it sticks, strikes Root, and shoots into Branches: Such is the Origin of Coral.

To which may be added, That a Root of a Plant may have any Situation at Pleasure, with respect to the Body thereof; nor needs it be either lowest or highest, &c. Accordingly in Coral, Mosses, Funguses, &c. the Root is frequently uppermost, and its Growth downwards.

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VEGETABLE STATICKS signifies the Weight or Gravity, and the Motion of the Juices, in vegetable Bodies.

VEGETATION is the Act whereby Plants receive Nourishment, and grow; the Word is derived from the *Latin*, *vegeto*, to quicken, to refresh, to make lively and strong; and signifies the Way of Growth, or Increase of Bulk, Parts, and Dimensions proper to all Trees, Shrubs, Herbs, Plants, Minerals &c.

To understand the Process of Nature in the Business of Vegetation, it is to be considered, that there is in Vegetables a principle of Life; and this is differently seated; there are some who suppose it is seated exactly between the Trunk and the Root, which they say is observed to be the Place of its Position, in all or most of the seminiferous Tribe; but if the Oak and some other Trees be included in that general Title, and their Bodies be cut down near that Place, it is odds if they ever shoot again, or at least to any Purpose.

In some Trees it is only the Roots which vegetate, so that let them be cut into as many Pieces as reasonably may be, if these Pieces are but planted in the Ground, they quickly grow, as is seen in the Elm, &c. and in many other Trees.

In some it is seated both in the Roots, and all over the Trunk and Branches, as in the vimineous or Willow Kinds, which, if they be cut into a thousand Pieces, it is scarce possible to destroy or kill them, unless they are stripped of both their Barks, for if you plant them in the Earth but the Length of three or four Inches, either the Roots or Branches will certainly grow again.

In some it is found entirely in the Body, Branches, or Leaves, and of this Kind are many of the Exoticks which being of a succulent Nature, if the Trunk or Branches, or the Leaves and Stems, be put into the Ground, they will strike Root immediately, and grow, as in the Cereuses, Ficoides, Sedums, &c. nay, so strong is the Principle of Life in this Kind of Plants, that if they be hung a considerable Time in the Air without any Earth, Water, &c. they will maintain their natural Verdure, and also this Principle of Life, admirably by their succulent Quality.

The Use of this Principle of Life is accounted to be for the Concoction of the indigested Salts, which ascend through the Roots, where they are supposed to assimilate the Nature of the Tree they are helping to form, though perhaps the Root may likewise assist in the Work.

These Things being presupposed, in the Spring of the Year, as soon as the Sun begins to warm the Earth, and the Rains melt the latent Salts, the whole Work of Vegetation is set on foot; then the emulgent Fibres seek for Food, which has been prepared as aforesaid.

It is very rational to suppose that a great Part of the Roots are formed under Ground during the Winter Season, because in all Lands there is always an innate Heat, which seems to be a natural vital Quality or nitrous Fermentation.

The Roots, by seeking out and assuming those nitrous Salts, are immediately (by the Course of Nature, and the attractive Virtue of the Sun), drawn upwards to the vital Principle, and, after Concoction, ascend still higher into the Stem, and break out first in the Buds,

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the shelly and tenderest Part of the whole Machine, and afterwards diffuse themselves into the Leaves, Flowers, Fruits, &c. which lie enveloped therein, according to their natural Frames, &c.

There are some who suppose that subterraneous Fires are concerned in the Work of Vegetation, or the Growth of Plants, yet as, upon the best Observation that can be made, none can pretend to have discovered any Heat or Fumigation to issue from the Bowels of the Earth, adequate to the meanest artificial Fire, it is plain that the Sun is the Principle, and so may be called the Father, of Vegetation, and the Earth the Mother, the Rain and Air being necessary Co-efficients in this surprising Work.

It is apparent, by the Use of Microscopes, that Plants consist of different Parts, Vessels, &c. analogous to those of Animals, and each Kind of Vessel is supposed to be the Vehicle of a different Humour, or Juice, secreted from the Matter of the Sap, which is considered as the Blood, or common Fund of them all.

Dr. Grew farther explains this, by saying, That all Kinds of vegetable Principles are at the first received together in a Plant, and are separated afterwards, i. e. they are filtered some from others, in very different Proportions and conjunctions by the several Parts, so every Part is the Receptacle of a Liquor, become peculiar, not by any Transformation, but only by the Percolation of Parts out of the common Mass or Stock or Sap, and those, that are superfluous in any Plant, are discharged back by Perspiration.

The same Author assigns the Offices of the several Vessels: He calls those Vessels *Lymphbeducts*, which are placed on the inner Verge of the Bark, and these, he supposes, are appointed for the Conveyance of the most aqueous or watry Liquor.

Those Vessels that are in the Middle of the Plant, he calls *Lactiferous* or *Resiniferous*; these he takes to be the principal *Viscera* of Plants, and that as the *Viscera* of Animals are but conglomerated Vessels, the *Viscera* of Plants are drawn out in Length.

It is also remarkable in many Cases, that the Multitude and Largeness of the Vessels produce a sweet and vinous Sap, and the Fewness and Smallness of the Vessels produce an oily and aromatic Sap.

It seems necessary to the Nutrition of Plants, as well as Animals, that there be a Concurrence of two specifically distant Fluids, and a certain Author maintains, That there is an Intermixture of two such Humours in every Part of a Tree, every Part of Sap being impregnated with other Tinctures, and continually filtered from Fibres of one Kind to those of another, and from this Mixture many of the Phenomena of the Ripening, Odour, &c. are accounted for.

With regard particularly to the Odour in Plants, Dr. Grew is of Opinion that they chiefly proceed from the Air Vessels that are in the Wood, not but that the other Parts also yield their Smells, which is most plain to be perceived in Plants that are fresh, undried, and unbruised, for he says that the Air, bringing along with it a Tincture from the Root, and from the several organical Parts, and at last entering the Concave of the Air Vessels, it consists there.

Others say, That it cannot be denied but the Effluvia,

via, which can be admitted into the Wood Vessels, may give a Smell to the Wood, but however, as that Vapour passes through the Vessels which have a different Structure, so as to alter the Form of its Parts, so in every one of its Changes it will yield a Smell different from the rest. The Smell of the Wood will differ from that of the Bark, the Juices in the one being more essential than the other, but yet both, being bruised and mixed together, yield a Scent different from either of them singly, and likewise the Leaves give a Scent that is different from either of the former, and so also do the Flowers from that in the Leaves, and also the Fruit from that in the Flowers.

Dr. Grew is of opinion that the chief governing Principle in the Juice of Plants, is the saline, which saline Principle, he says, must be understood as a generic Term, under which divers Species are comprehended. The vegetable Salts seem to be four, viz. the nitrous and the acid, alkaline and marine, and of these the nitrous Salts seem to be assigned by Nature chiefly for the Growth of Plants.

The curious *Malpighius* has very accurately delivered the Process of Nature in the Vegetation of Plants to the Effect following:

The *Ovum* or Seed of the Plant, being excluded out of the Ovary (which is called the Pod or Husk,) and requiring farther fostering and brooding, is committed to the Earth. The Earth, like a kind Mother, having received it into her Bosom, does not only perform the Office of Incubation, by her own warm Vapours and Exhalations, in Conjunction with the Heat of the Sun, but gradually supplies what the Seed requires to its farther Growth, as abounding every-where with Canals and Sinuses, in which the Dew and Rain Water, impregnated with fertile Salts, glide like the Chyle and Blood in the Arteries, &c. of Animals.

This Moisture, meeting with the new-deposited Seed, is percolated or strained through the Pores or Pipes of the outer Rind or Husk, answering to the *Secundines* of *Fœtus*, on the Inside whereof lie one or more, commonly two, thick seminal Leaves corresponding to the *Placenta* in Women, and the *Cotyledons* in Brutes.

The Seed Leaves consist of a great Number of little *Vesiculæ*, or Bladders, with a Tube corresponding to the Naval Strings in Animals.

The Moisture of the Earth, strained through the Rind of the Seed, is received into these *Vesiculæ*, which causes a slight Fermentation with the proper Juice before contained therein.

This fermented Liquor is conveyed by the umbilical Vessel to the Trunk of the little Plant, and to the Gem or Bud which is contiguous to it, upon which a Vegetation and Increase of the Plant succeed.

This Procedure in the Vegetation of Plants, the aforesaid Author exemplifies in a Grain of Wheat, as follows:

The first Day the Grain is sown, it grows a little turgid, and the *Secundine* or Husk gapes a little in several Places, and the Body of the Plant, being continued by the umbilical Vessel to a conglobated Leaf (which is called the Pulp or Flesh of the Seed, and is what con-

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stitutes the Flower,) swells, by which means, not only the Gem or Sprout (which is to be the future Stem) opens and increases, but the Roots begin to bunch out, whence the *Placenta* or Seed Leaf, becoming loose, gapes.

The second Day the *Secundine* or Husk, being broken through the Stem or Top of the future Straw, appears on the Outside thereof, and grows upwards by Degrees.

In the mean Time, the Seed Leaf, guarding the Roots, becomes turgid with its *Vesiculæ*, and puts forth a white Down, and the Leaf being pulled away, you see the Roots of the Plant bare, the future Bud, Leaves, and the rest of the Stalk lying still hid. Between the Roots and the ascending Stem, the Trunk of the Plant is knit by the Navel Knot to the Flower Leaf which is very moist, though it still retains its white Colour, and its natural Taste.

The third Day the Pulp of the conglobated or round Leaf becomes turgid with the Juice it has received from the Earth fermenting with its own.

Thus the Plant increases in Bigness, and in its Bud or Stem becomes taller, and from whitish turns greenish. The lateral Roots also break forth greenish and pyramidal from the gaping Sheaf, which adheres closely to the Plant, and the lower Roots grow longer and hairy, with many Fibres growing out of the same.

Indeed, there are hairy Fibres hanging all along on all the Roots, except on the Tops, and these Fibres are seen to wind about the saline Particles of the Soil, or little Lumps of Earth, &c. like Ivy, whence they grow curled. About the lateral Roots there now break out two other little ones.

The fourth Day the Stem, mounting upwards makes a right Angle with the seminal Leaf. The last Roots put forth more, and the other three, growing larger, are clothed with more Hairs, which straitly embrace the Lumps of Earth, and where they meet with any Vacuity, unite into a Kind of Net Work. The Conglobate or Flower Leaf is now foster, and, when bruised, yields a white sweetish Juice, like Barley Cream. By stripping it off, the Root and Stem of the Plant are plainly seen, with the intermediate Naval Knot, whose outer Part is solid like a Bark, and in the inner more soft and medullary.

The fifth Day the Stalk, still rising, puts forth a permanent or stable Leaf, which is green and folded. The Roots grow longer, and there appears a new Tumour of a future Root; the Outer or Sheath is loosened, and the Seed Leaf begins to fade.

The 6th Day the Stable Leaf being loosened, the Plant mounts upwards, the Sheaf still cleaving round it like a Bark. The Seed Leaf is now seen sinuous or wrinkled, and faded, and this being freed or cut from the *Secundine*, the Flesh or *Pericarpium* is found of a different Texture, the outer Part, whereby the Outside of the Seed or Grain is heaped up, being more solid, but the Inside viscular, and full of Humour, especially that Part next the Naval Knot. All the Leaves being pulled off, the Roots torn, and the Flower Leaf removed, the Trunk appears, wherein, not far from the Roots, the Naval Knot bunches out, which is solid, and hard to cut; above there is a Mark of the Sheath

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Leaf, which was pulled off, and underneath, as in an Arm-pit, the Gem is often hid; the Part of the Plant shews the breaking forth of the Roots likewise, with the faded *Placenta*, &c.

After the eleventh Day the Seed Leaf, as yet sticking to the Plant, is crumpled, and almost corrupted; within it is hollow, and about the *Secundine*, the Mucus and white Substance of the Seed, being continued to the Navel Knot, forms a Cavity; all the Roots, becoming longer, put forth new Branches out of their Sides. The second Leaf withers, and its Vesicles are emptied; the Internodes or Spaces between the Knots grow longer; new Gems appear, and the middle Root grows several Inches longer.

After a Month, the Roots and Stalk being grown much longer, new Buds break out at the first Knot, and little Tumours bunch out, which, at length, break out into Roots.

As to the vegetable Matter, or the Food where the Plants grow, there is some Doubt; it hath been a general Opinion amongst almost all the modern Naturalists, That the Vegetation of Plants, and even of Minerals too, is principally owing to Water, which not only serves as a Vehicle to convey to them the fine rich Earth, &c. proper for their Nourishment, but being transmuted into the Body of the Plant, affords the greatest Part, if not all the Matter with which they are nourished; and by which they grow and increase in Bigness. This Opinion is countenanced by very great Names, particularly by the ingenious Dr. Woodward, who, in order to ascertain this Point, made the following Experiments:

In the first Place, he carefully examined all Sorts of Water, and found that the clearest fine Spring Water, which he could any where meet with, exhibited even to the naked Eye great Numbers of exceeding small terrestrial Particles, and that all other crasser Waters had these in yet much greater Quantity, and also, that they were of a larger Bulk.

He found this terrestrial Matter contained in all Water to be of two Kinds; the one properly a vegetable Matter, but consisting of very different Particles, some of which are very proper for the Nourishment of some Kinds of Plants, others for different Sorts, &c. The other Kind of earthy Matter he found to be purely of a mineral Nature, and this also was of very various and different Kinds.

The former Sort of vegetable earthy Matter abounds plentifully in all Waters, but for the mineral, it is found mostly in Spring Water, next to that, in River Water, and least of all, in Rain Water, though even there also it is to be found plentifully.

This Fact, he says, any one may discover, by only keeping Water for a competent Time without stirring it, in a clear Glass Phial, closely stopped to keep out Dust, &c. for then he will observe that these very small terrestrial Particles, which before were scarcely visible singly, will now combine together into large and more conspicuous Masses, which, by degrees, will join together, and form Clouds, as it were, in the Water, which will grow daily more and more opacous and thick by the continual Accession of new Matter; and if the earthy

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Matter in the Water be chiefly of the vegetable Kind, it will turn the Water green, the usual Colour of Vegetables, and this will grow deeper and deeper coloured, but will not precipitate to the Bottom of the Glasses, as the mineral Water will, if there be any considerable Quantity, by reason of its much greater specific Gravity. On the whole therefore he concludes very justly, That there is in all Water a considerable Quantity of the earthy Matter. And in order to determine whether the Vegetation of Plants was chiefly owing to bare Water or not, rather than to the terrestrial Matter therein contained, he made with very great Accuracy and Care several Experiments.

Which Experiments, because they were done with an uncommon Care and Exactness, are sufficiently Numerous, and are followed by very ingenious Reflections, serving to explicate many Difficulties of Philosophy, and to set the whole Affair of Vegetation in a very good Light: I shall give the Register as follows:

Anno Dom. 1691, he chose several Glass Phials, that were all, as near as possible, of the same Shape and Bigness. After he had put what Water he thought fit into every one of them, and taken an Account of the Weight of it, he strained and tied over the Orifice of each Phial a Piece of Parchment, having Holes in the Middle of it large enough to admit the Stem of the Plant he designed to set into the Phial, without confining or streightening it so as to impede its Growth. His Intention in this was to prevent the inclosed Water from evaporating or ascending any other Way than only through the Plant to be set therein.

Then he made Choice of several Sprigs of Mint and other Plants, that were, as near as he could possibly judge, alike found, fresh, and lively. Having taken the Weight of each, he placed them in a Phial, ordered as above, and as the Plant imbibed and drew off the Water, he took Care to add more of the same from Time to Time, keeping an Account of the Weight of all he added. Each of the Glasses were, for better Distinction, and the more easy keeping a Register of all the Circumstances, noted with a different Mark or Letter, as A, B, C, &c. and all set in a Row in the same Window, in such Manner that all might partake alike of Air, Light, and Sun.

Then they continued from July the 20th to October the 5th, which is just 77 Days, when he took them out, weighed the Water in each Phial, and the Plant likewise, adding to its Weight that of all the Leaves that had fallen off, during the Time it had stood thus, and lastly he computed how much each Plant had gained, and how much Water was spent upon it.

The Particulars are as follow:

The Plant weighed, when put in, July the 20th, just 27 Grains; when taken out, October the 5th, 42 Grains, so that in the Space of 77 Days it had gained in Weight 15 Grains.

The whole Quantity of Water, expended during the 77 Days, amounts to 2558 Grains. Consequently the Weight of the Water had taken up $170\frac{1}{2}$ Times the Grains as much as the Plant had gained in Weight.

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This will be made plainer by the following TABLE.

Weight of the Plant when first put into Water.	Weight of the Plant when taken out of the Water.	Weight gained by the Plant during the 77 Days.	Weight of the Water expended upon the Plant.	Proportion of the In- crease of the Plant to the Expence of the Water.
A				
27 Grains.	<i>Common Spear-mint.</i> 42 Grains.	15 Grains.	<i>Spring Water.</i> 2558 Grains.	as 1 to 170 $\frac{8}{15}$
B				
28 $\frac{1}{2}$ Grains.	<i>Common Spear-mint.</i> 45 $\frac{1}{2}$ Grains.	17 $\frac{1}{2}$ Grains.	<i>Rain Water.</i> 3004 Grains.	as 1 to 171 $\frac{11}{15}$
C				
28 Grains.	<i>Common Spear-mint.</i> 54 Grains.	26 Grains.	<i>Thames Water.</i> 2493 Grains.	as 1 to 95 $\frac{13}{16}$
D				
49 Grains.	<i>Common Solanum, or Nightshade.</i> 106 Grains.	57 Grains.	<i>Spring Water.</i> 3708 Grains.	as 1 to 65 $\frac{3}{4}$
E				
98 Grains.	<i>Latbyrus, seu Cataputia.</i> 101 $\frac{1}{2}$ Grains.	3 $\frac{1}{2}$ Grains.	<i>Ger. Spring Water.</i> 2501 Grains.	as 1 to 714 $\frac{7}{8}$

The Specimen D had several Buds upon it, when first set into the Water; these, in some Days, became fair Flowers, which were at length succeeded by Berries. Several other Plants were tried, which did not thrive in Water, nor succeed any better than the *Cataputia* foregoing.

The Phials F and G were filled, the former with Rain, and the other with Spring Water, at the same Time as those above mentioned were, and stood as long as they did, but they had neither of them any Plant, the Design of which was in order to learn, whether any Water exhaled out of the Glasses, otherwise than through the Bodies of the Plants.

The Orifices of these two Glasses were covered with Parchment, each Piece of it being perforated with an Hole of the same Bigness with those of the Phials above. In these was suspended a Bit of Stick about the Thickness of the Stem of one of the aforesaid Plants, but not reaching down to the Surface of the inclosed Water, that the Water in these might not have more Scope to evaporate than that in the other Phials.

Thus they stood the whole 77 Days with the rest, when, upon Examination, none of the Water was found to be wasted, or gone off, though he observed both in these and the rest, especially after very hot Weather, small Drops of Water, not unlike to Dew, adhering to the Insides of the Glasses, i. e. that Part of them that was above the Surface of the inclosed Water.

The Water in these two Glasses that had no Plants in them, at the End of the Experiment exhibited a

larger Quantity of terrestrial Matter, than that in any of those that had the Plants in them did.

The Sediment in the Bottom of the Phials was greater, and the *Nubeculae* diffused through the Body of the Water thicker, and of that which was in the others, some of it proceeded from certain small Leaves that had fallen from that Part of the Stem of the Plants that was within the Water, wherein they rotted and dissolved.

The terrestrial Matter in the Rain Water was finer than that of the Spring Water.

Experiments, Anno 1692.

The Glasses made use of in this were of the same Sort with those of the former Experiment, and covered over with Parchment after the same Manner.

The Plants here were all Spear Mint, the most kindly, fresh, sprightly Shoots he could choofe. The Water and Plants were weighed, as above, and the Phials set in a Line in a South Window, where they stood from June the 2d to July the 28th, which was just 55 Days.

The Plant H was all along a very kindly one, and ran up about two Feet in Height. It had shot but one considerable collateral Branch, but had sent forth many and long Roots, from which sprung very numerous, though small and short lesser Fibres. The lesser Roots came out of the larger on two opposite Sides for the most part, so that each Root, with its *Fibrillae*, appear not unlike a small Feather; to these *Fibrillae* adhered pretty much terrestrial Matter. In the Water, which

VEG

was at last thick and turbid, was a green Substance, resembling a fine thin *Conserva*.

The Plant I was as kindly as the former, but had shot no collateral Branches. Its Roots, the Waters, and the green Substance, all much as in the former.

The Plant K, though it had the Misfortune to be annoyed with very small Insects that happened to fix upon it, yet had shot very considerable collateral Branches, and at least as many Roots as either H or I, which had a much greater Quantity of terrestrial Matter adhering to the Extremities of them. The same green Substance here that was in the two preceding.

The Plant L was far more flourishing than any of the preceding, had several considerable collateral Branches, and very numerous Roots, to which terrestrial Matter adhered very copiously.

VEG

The Earth in both these Glasses was very sensibly and considerably wasted, and less than when first put in. The same Sort of green Substance here as in those above.

The Plant M was pretty kindly, had two small collateral Branches, and several Roots, though not so many as those in H or I, but as much terrestrial Matter adhering to them as those had. The Water was pretty thick, having very numerous small terrestrial Particles swimming in it, and some Sediment at the Bottom of the Glas. This Glas had none of the green Matter above mentioned in it.

The Plant N was very lively, and had sent out six collateral Branches, and many Roots, but the Water was very turbid, and as high coloured as ordinary Beer.

Weight of the Plant when first set in Water.	Weight of the Plant when taken out of the Water.	Weight gained by the Plant when it had stood 56 Days.	What of the Water is expended upon the Plant.	Proportion of the Increase of the Plant to the Expence of the Water.
H				
<i>Hyde-Park Conduit Water alone.</i>				
127 Grains.	255 Grains.	128 Grains.	14190 Grains.	as 1 to 110 $\frac{110}{127}$.
I				
<i>The same Water alone.</i>				
110 Grains.	249 Grains.	139 Grains.	13140 Grains.	as 1 to 94 $\frac{94}{110}$.
K				
<i>The same Water, with an Ounce and a Half of common Garden Earth dissolved in it.</i>				
76 Grains.	244 Grains.	168 Grains.	10731 Grains.	as 1 to 63 $\frac{63}{76}$.
L				
<i>Hyde-Park Water, with the same Quantity of Garden Mold as the former.</i>				
92 Grains.	376 Grains.	284 Grains.	14950 Grains.	as 1 to 52 $\frac{52}{92}$.
M				
<i>Hyde-Park Water, distilled with a gentle Still.</i>				
114 Grains.	155 Grains.	41 Grains.	8803 Grains.	as 1 to 214 $\frac{214}{41}$.
N				
<i>The Residue of the Water which remained in the Still after that in M was distilled off.</i>				
81 Grains.	175 Grains.	94 Grains.	4344 Grains.	as 1 to 46 $\frac{46}{94}$.

The Glas O had also *Hyde-Park Conduit Water*, in which was dissolved a Dram of Nitre. The Mint set in this suddenly began to wither and decay, and died in a few Days, as likewise did two more Sprigs that were set in it successively. In another Glas he dissolved an Ounce of good Garden Mold, and a Drachm of Nitre, and, in a third, half an Ounce of Wood Ashes, and a Drachm of Nitre, but the Plants in these succeeded no better than the former. In other Glasses he dissolved several other Sorts of Earth, Clay, Marls, and Variety of Manures, &c. and he set Mint in distilled Mint Water, and made other Experiments of several Kinds, in order

to get a Light and Information what hastened or retarded, promoted or impeded, Vegetation.

The Glas P, *Hyde-Park Conduit Water*: In this he fixed a Glas Tube ten Inches long, the Bore one Sixth of an Inch Diameter, filled with very fine and white Sand, which he kept from falling down out of the Tube into the Phial, by tying a fine Piece of Silk over that End of the Tube that was downwards. Upon Immersion of the lower End of it into the Water, this, by little and little, ascended quite up to the Orifice of the Tube, and yet, in all the 56 Days that it stood thus, a very inconsiderable Quantity of Water had gone off, viz.

viz. scarcely 20 Grains, though the Sand continued moist up to the Top till the very last.

The Water had imparted a green Tincture to the Sand quite to the very Top of the Tube, and in the Phial it had precipitated a greenish Sediment mixed with black. To the Bottom and Sides of the Tube, as far as it was immersed in the Water, adhered pretty much of the green Substance described above.

Other like Tubes he filled with Cotton, Lint, Pith of Elder, and several other porous vegetable Substances, setting some of them in clear Water, others in Water tinged with Saffron, Cochineal, &c. and several other Trials were made, in order to give a mechanical Representation of the Motion and Distribution of the Juices in Plants, and of some other Phenomena observable in Vegetation.

Several Plants being also set in the Phials Q, R, S, &c. ordered in like Manner as those above in October, and the following colder Months these throve not near so much; nor did the Water ascend nigh the Quantity it did in the hotter Seasons, in which the before cited Trials were made.

The Result of all which Experiments he gives us in the following Observations and Reflexions:

I. *In Plants of the same Kind, the less they are in Bulk, the smaller Quantity of the fluid Mass in which they are set is drawn off; the Consumption where the Mass is of equal Thickness, being pretty nearly proportioned to the Bulk of the Plant.*

In Effect, the Water seems to ascend up the Vessels of the Plants, in much the same Manner as up a Filter; and it is not to be wondered at, that the larger Filter should draw off more Water than the smaller; or that a Plant that hath more or larger Vessels, should take up a greater Part of the Fluid in which it is set, than one that has fewer can. Nor is it thus noted as a Thing very considerable in itself, but chiefly with regard to what follows:

II. *Much the greater Part of the fluid Mass, thus drawn off, and conveyed into the Plant, does not settle or abide there, but passes through their Pores, and exhales up into the Atmosphere.*

That the Water, in these Experiments, ascended only through the Vessels of the Plants is certain, since some Glasses, which had no Plants in them, though disposed in the like Manner as the rest, did remain, at the End of the Experiment, as at first, and without any Diminution of Water, and that the greatest Part of it flies off from the Plant into the Atmosphere, is as certain.

The least Proportion of the Water expended was to the Augment of the Plant, as 46 or 50 to 1; and in some 100, 200 in 1, as 700 to 1.

Thus so continual an Emission of Water, in so great Plenty, from the Parts of the Plant, affords a manifest Reason, why Countries that abound with Trees, and the larger Vegetables especially, should be very obnoxious to Damp, great Humidity in the Air, and more frequent Rains, than others that are more open and free.

The great Moisture of the Air was a great Inconvenience and Annoyance to those who first settled in America; which, at that Time was overgrown with Woods

and Groves; but as these were burnt down and destroyed to make Way for Habitations, and the Culture of the Earth, the Air mending, changed into a Temperature more serene and dry than before.

Nor does this Humidity go off pure and alone, but usually carries with it many Parts of the same Nature with those whereof the Plant consists; the crasser indeed are not so easily borne up into the Atmosphere, but are usually deposited on the Surface of the Leaves, Flowers and other Parts of the Plants; whence proceed our Mannas, our Honeys, and other gumous Exudations of Vegetables; but the finer and lighter Parts are with greater Ease sent up into the Atmosphere, thence they are conveyed to our Organs of smelling, by the Air we draw in Respiration, and are pleasant or offensive, beneficent or injurious to us, according to the Nature of the Plants from whence they arise. And since these owe their Rise to the Water that ascends out of the Earth through the Bodies of Plants, we cannot be far to seek for the Cause why they are more numerous in the Air, and a greater Quantity of Odors is found exhaling from Vegetables in warm humid Seasons, than in any other.

III. *A greater Part of the terrestrial Matter that is mixed with Water, ascends up into the Plant as well as the Water.*

There was much more terrestrial Matter at the End of the Experiment, in the Water of the Glasses that had no Plants in them, than in those that had Plants. The Garden Mold dissolved in some of the Glasses was considerably diminished, and carried off; nay the terrestrial and vegetable Matter was borne up in the Tubes filled with Sand, Cotton, &c. in that Quantity as to be evident even to Sense; and the Bodies in the Cavities of the other Tubes, that had their lower Ends immersed in Water, wherein Saffron, Cochineal, &c. had been infused, were tinged with yellow, purple, &c.

To look abroad a little towards our Shores and Parts within the Verge of the Sea, these will present us with a large Scene of Plants, that, along with the Vegetables, take up more mineral Matter also in great Abundance; such as our Sea Purslain, several Sorts of Algas, of Samphires, and other marine Plants; those contain common Sea Salts, which are the same as the Fossil, in such Plenty, as not only plainly to be distinguished in the Palate, but may be drawn out of them in a considerable Quantity; nay some affirm there are Plants found, that will yield Nitre and other mineral Salts.

The vegetable Matter, being very fine and light, is surprisngly apt and disposed to attend Water in all its Motions, and follow it into each of its Recesses, as appears not only from the Instances above alledged, but many others, percolate it with all the Care imaginable, filter it with ever so many Filtrations, yet some terrestrial Matter will remain.

Dr. Woodward has filtered Water through several Sheets of thick Paper, and after that through very close fine Cloth, twelve Times double, and this over and over; and yet a considerable Quantity of this Matter discovered itself in the Water after all.

Now if it thus passes Interstices that are so very small and fine along with the Water, it is less strange it should attend it in its Passage through the Ducts and Passage

Passages of Plants. It is true filtering and distilling of Water interrupts, and makes it quit some of the earthy Matter it was before impregnated withal; but then that which continues with the Water after this, is fine and light, and such consequently, as is in a peculiar Manner fit for the Growth and Nourishment of Vegetables.

And this is the Case of Rain Water. The Quantity of terrestrial Matter it bears up into the Atmosphere is not great; but what it doth bear up is chiefly of that light Kind, or vegetable Matter, and that too perfectly dissolved, and reduced to single Corpuscles, all fit to enter the Tubes and Vessels of Plants; on which Account it is that this Water is so very fertile and prolific.

The Reason why all the terrestrial Matter mixed with the Water does not ascend into that, is, that the mineral Matter makes a great deal of it, which is not only gross and ponderous, but scabrous and inflexible, and so not disposed to enter the Pores of the Roots; besides, a great many of the simple vegetable Particles do by Degrees unite and form small Clods, or *Molecules*, which stick to the Extremities of the Roots of those Plants, and others of them entangled in a looser Manner from the *Nubeculae*, or green Bodies, so commonly observed in stagnant Water; these, when thus conjoined are too big to enter the Pores, or ascend up the Vessels of Plants, which singly they might have done.

Hence it is, that in Agriculture, be the Earth never so rich, good, and fit for the Production of Corn, or other Vegetables, little will come of it, unless the Particles be separated and loose; and it is on this Account such Pains are bestowed in the digging, tilling, ploughing, fallowing, harrowing, and breaking the clodded Lumps of Earth; and it is the same Way that Sea Salt, Nitre, and other Salts promote Vegetation.

Some Authors imagine Nitre essential to Plants, and that nothing in the Vegetable Kingdom is transacted without it; but Dr. Woodward says, by all the Trials he has been able to make, the Thing seems to him quite otherwise; and when contiguous to the Plant, Nitre rather destroys than nourishes it. This I have myself found to be true, for by scattering some Nitre round the Roots of three or four Plants, it killed them in a few Days.

But Nitre and other Salts certainly loosen the Earth, and separate the concreted Parts of it, by that Means fitting and disposing them to be assumed by the Water, and carried up into the Seed or Plant for its Formation and Increase.

It is evident to Observation, how apt all Sorts of Salts are to be wrought upon by Moisture, how easily they run with it; and when these are drawn off, and have deserted the Lumps with which they are incorporated, they must moulder immediately, and fall asunder in course.

The hardest Stone that is to be met with, if it happens (as it frequently does) to have any Salt intermixed with the Sand of which it consists, upon its being exposed in a humid Air, in a short Time dissolves and crumbles all to Pieces; and much more will clodded Earth or Clay, which is not of so compact and solid a Constitution.

Lime likewise is in the same Way Serviceable in this Affair. The Husbandmen say, it does not fatten, but

only mellows the Ground, by which they mean, it doth not contain any Thing in itself, that is of the same Nature with the vegetable Mould, or afford any Matter fit for the Formation of Plants, but merely softens and relaxes the Earth; by that Means rendering it more capable of entering the Seeds and Vegetables set in it, in order to their Nourishment, than otherwise it would have been.

The Properties of Lime are well known, and how apt it is to be put into a Ferment and Commotion by Water; nor can such Commotion ever happen, when Lime is mixed with Earth, however hard and clodded it may be, without opening and loosening it.

IV. *The Plant is more or less nourished, in Proportion as the Water in which it stands, contains a greater or smaller Quantity of proper terrestrial Matter in it.*

The Truth of this Proposition is discernible through the whole Process of the Doctor's Experiments. The Mint in one of the Glasses was of much the same Bulk and Weight with that of two or three others; but the Water in which the first was, being River Water, which was apparently more copiously stored with terrestrial Matter, than the Spring or Rain Water, in which the other stood, occasioned it to arrive at almost double the Bulk that either of them had, and with a less Expence of Water too.

So likewise the Mint in another Glass, in the Water of which was dissolved a small Quantity of good Garden Mold; though it had the Disadvantage to be less when first set, than either of the Mints in the two other Glasses had, the Water in which was the very same as the first, only none of the Earth mixed with it; yet in a short Time the Plant not only overtook, but much outstripped the other.

The Reason why the Proportion of the Increase of the Plant was limited to the Quantity of proper terrestrial Matter in the Water, is, that all, even vegetable Matter, is not proper for the Nourishment of every Plant; nor do there want good Indications, that every Kind requires a peculiar and specific Matter for its Formation and Nourishment; nay each Part of the same Vegetable; and that there are very many and different Ingredients to go to the Composition of the same individual Plant.

If therefore the Soil wherein any Vegetable or Seed is planted, contains all or most of these Ingredients, and those in due Quantity, it will grow and thrive, otherwise it will not. If there be not as many Sorts of Corpuscles as are requisite for the Constitution of the main and more essential Parts of the Plant, it will not prosper at all. If there are these, and not in sufficient Plenty, it will never arrive to its natural Stature, or if any of the less necessary and essential Corpuscles are wanting, there will be some Failure in the Plant. It will be defective in Smell, Taste, Colour, and some other Way.

Indeed it is inconceivable, how one uniform homogeneous Matter, having its Principles, or original Parts, of the same Substance, Constitution, Magnitude, Figure and Gravity, should constitute Bodies so unlike in all those Respects, as vegetables of different Kinds are; nay even as the different Parts of the same Vegetable; that one should carry a resinous, another a milky, a third a yellow, and a fourth a red Juice in its Veins; that

that one affords a fragrant, another an offensive Smell ; one sweet to the Taste, another acid, bitter, acerb, austere, &c. that one should be nourishing another poisonous ; one purging, another astringent ; and these all receive their Nourishment from the same Soil.

A *Cataputia*, *tithymalus latifolius cataputia dicta*, in one of the Glasses afforded but a little Increase, only $3\frac{1}{2}$ Grains all the while, though 2501 Grains of Water were spent upon it ; but this might possibly be owing not to the Water's wanting Matter fit for the Nourishment of that particular Plant, but from its being an improper Medium for that to grow in. Too much of that Liquor in some Plants may probably hurry the terrestrial Matter through the Vessels too fast for them to lay hold of it.

But a farther Proof of this Matter is, that the Soil once proper for the Production of some Sort of Vegetables, does not ever continue so, but in Tract of Time loses its Property ; and sooner in some Lands, and later in others.

As for Example : If Wheat be sown upon Land proper for that Grain, the first Crop will succeed very well, and perhaps the second and third, as long as the Ground is in Heart, as the Farmers call it ; but in a few Years it will produce no more, if sowed with that Corn ; some other Grain it may, as Barley ; and after this has been sown so oft, that the Land can bring no more of it, it may afterward yield some good Oats, and perhaps Peas after them.

At length it becomes barren ; the vegetative Matter that at first it abounded with, being reduced by the successive Crops, and most of it born off, each sort of Grain takes out that peculiar Matter that is proper for its own Nourishment.

It may be brought to bear another Series of the same Vegetables ; but not till it is supplied with another Fund of Matter of the like Sort with what it first contained ; either by the Ground's lying fallow for some Time, till the Rain hath poured a fresh Stock upon it, or by the manuring it.

That this Supply is of the like Sort is evident by the several Manures found best to promote the Vegetation ; which are chiefly either of Parts of Vegetables, or of Animals ; of Animals, which either derive their own Nourishment immediately from vegetable Bodies or from other Animals that do so ; in particular, the Blood, Excrements, and Urine of Animals that do so ; Shaving of Horns and Hoofs, Hair, Feathers, calcined Shells, Lees of Wine and Beer, Ashes of all Sorts of vegetable Bodies, Leaves, Straw, Roots, and Stubble, turned into Earth by ploughing, or otherwise, to rot and dissolve there.

These are our best Manures ; and, being vegetable Substances, when refunded back again into the Earth, serve for the Formation of other Bodies.

But to apply this to Gardens, where the Trees, Shrubs, and Herbs, after their having continued in one Station till they have derived thence the greatest Part of the Matter fit for their Increase, will decay and degenerate, unless either fresh Earth, or some fit Manure, be applied to them.

It is true they may maintain themselves there for some Time, by sending forth Roots farther and farther,

to an Extent all around, to fetch in more Provision ; but at last they must have a fresh Supply brought to them, or they will decay.

All these Instances argue a particular terrestrial Matter, and not Water, for the Subject to which Plants owe their Increase ; were it Water only, there would be no need of Manures, or changing the Species ; the Rain falls in all Places, in this Field and in that, indifferently, on one Side of an Orchard or Garden, as well as the other ; nor could there be any Reason, why a Tract of Land should yield Wheat one Year and not the next, since the Rain showers down all alike upon the Earth.

V. *Vegetables are not formed of Water, But of a certain peculiar terrestrial Matter.*

It has been shewn, that there is a considerable Quantity of this Matter both in Spring, Rain, and River Water ; and the Experiments before mentioned shew, that the much greatest Part of the fluid Mafs, that ascends up into Plants, does not settle or abide there, but passes through the Pores of them, and exhales into the Atmosphere ; and that a great Part of the terrestrial Matter, mixed with the Water, passes up into the Plant along with it, and that the Plant is more or less augmented, in Proportion as the Water contains a greater or less Quantity of Matter ; from all which we may reasonably infer, that Earth, and not Water, is the Matter which constitutes Vegetables.

One of the Sprigs of Mint before mentioned drew up into it 2501 Grains of the fluid Mafs, and yet had received but $3\frac{1}{2}$ Grains of Increase from it.

A second, though it had at first the Disadvantage to be much less than a third, yet being set in Water, wherein Earth had been plentifully mixed, and the other in Water without any such Earth, it had vastly outgrown it, weighing at least 145 Grains more than that did.

A fourth Plant, though at first a great deal less than the fifth, yet being set in foul crass Water, that was left in the Still, after that in which the last was set was drawn off, had gained in Weight at the End, above double what that in the finer and thinner Water had.

The Proportion of the Augment of that Plant, which throve most, was in the said Mafs spent upon it, but as 1 to 46 ; in others as 1 to 60, 100, 200 ; and in the *Cataputia*, but as 1 to 714.

One of the Sprigs took up 39 Grains of Water a Day, one Day with another, which was much more than the whole Plant originally ; and yet it gained not $\frac{1}{4}$ of a Grain a Day in Weight.

And another took up 253 Grains a Day, which was near twice as much as its original Weight ; and after all the daily Increase of the Plant was no more than $2\frac{1}{2}$ Grains.

VI. *Spring and Rain Water contain near an equal Charge of vegetable Matter ; River Water more than either of them.*

These Proportions hold in the main ; but a strict and just Composition is hardly to be expected ; inasmuch as in all Probability, the Water that falls in Rain, contains sometimes a greater Share of terrestrial Matter, than that which falls at other Times ; a more powerful and intense Heat, of Necessity, hurrying up a larger Quantity of that Matter, along with the humid Vapours that

that form Rain, than one more feeble and remiss possibly can.

The Water of one Spring may flow forth with a higher Charge of this Matter than that of another, this depending partly upon the Quickness of the Ebullition of the Water, and partly on the Quantity of that Matter latent in the *Strata*, through which the Fluid passes, and the greater or less Laxity of those *Strata*; for the same Reason the Water of one River may abound with it more than that of another; nay the same River, when much agitated and in Commotion, must bear up more of it, than when it moves with less Rapidity and Violence. That there is a great Quantity of ordinary Fertility of the Earth, the *Nile* affords a pregnant Instance, and so does the *Ganges* and other Rivers, which annually overflowing the neighbouring Plains, their Banks shew the fairest and largest Crops of any in the World.

VII. *Water serves only for a Vehicle to the terrestrial Matter which Forms Vegetables, and does not itself make any Augmentation to them.*

Where the proper terrestrial Matter is wanting, the Plant is not augmented, though never so much Water ascend into it: Water then is not the Matter that composes vegetable Bodies; it is only the Agent that conveys the Matter into them, that distributes it to their several Parts to their Nourishment; that Matter is sluggish and inactive, and would lie eternally confined to its Beds of Earth, without advancing up into Plants, did not Water, or some like Instrument, fetch it forth, and carry it into them.

This Fluid is capacitated several Ways for the Office here assigned it, by the Figure of its Parts, which appears from many Experiments to be exactly and mathematically spherical, their surfaces being perfectly polite, and without any the least Irregularities.

It is evident, that Corpuscles of such a Figure are easily susceptible of Motion, and far above any others whatever, and consequently more capable of moving and conveying other Matter that is not so active; then the Intervals of the Bodies of that Figure are, in respect to their Bulk, of all others the largest, and so the most fitted to receive and entertain foreign Matter in them; besides as far as the Trials hitherto made inform us, the constituent Corpuscles of Water are each singly considered absolutely solid, and do not yield to the greatest external Force; this secures their Figure against any Alteration, and the Intervals of their Corpuscles must be always alike.

By the latter it will be ever disposed to receive Matter into it; and by the former, when once received, to bear it along with it. Water is farther capacitated to be a Vehicle to this Matter, by the Tenuity and Fineness of the Corpuscles of which it consists. We hardly know any Fluid in all Nature, except Fire, whose constituent Parts are so exceeding subtle and small as those of Water are; they will pass Pores and Interstices that neither Air nor any other Fluid will. This enables them to enter the Tubes, and finest Vessels of Plants, and to introduce the terrestrial Matter, and convey it to all Parts of them, whilst each, by means of Organs it is endued with for that Purpose, intercepts and assumes into itself, such Particles as are

suitable to its own Nature, letting the rest pass on through the common Ducts.

VIII. *Water is not capable of performing this Office to Plants, unless assisted by a due Quantity of Heat.*

Heat must concur, or Vegetation will not succeed. The Plants set in the Glasses in *October*, and the following Months, had not near the Quantity of Water sent up into them, or so great an additional Increase by much as those that were set in *June*, *July*, or the hotter Months.

It is plain the Water has no Power of moving itself, or rising to the vast Height it doth, in the more tall and lofty Plants; so far from it, that it doth not appear by any Discovery yet made, that even its own Fluidity consists in the intestine Motion of its Parts, whatever the *Cartesians* think.

Indeed we want nothing more to solve all the Phenomena of Fluidity, than such a Figure and Disposition of Parts as Water has: Spherical Corpuscles must stand so ticklish upon each other, as to be susceptible of every Impression, and though not perpetually in Motion, must be always ready and liable to be put into it by any the slightest Force imaginable. It is true, the Parts of Fire or Heat are not capable of moving themselves any more than those of Water, but they are more subtle, light, and active than those are, and so the more easily put in Motion.

That the Concourse of Heat is really necessary in this Work, appears not only from the Experiments before us, but from all Nature, from the Fields and Forests, Gardens and Orchards. We see in Autumn, as the Sun's Power is gradually less and less, so its Effect on Plants is remitted, and Vegetation slackens by little and little.

Its Failure is first discernible in Trees, which being raised highest above the Earth, require a more intense Heat to elevate the Water charged with Nourishment to their Tops, so that, for Want of fresh Support and Nutriment, they shed their Leaves, unless supported by a very firm and hard Constitution, as our Evergreens are. Next, the Shrubs part with theirs; then the Herbs and lower Tribes, the Heat at length not being sufficient to supply even to those, though so near the Earth, the Fund of their Nourishment.

As the Heat returns the succeeding Spring, they all recruit again, and are furnished with fresh Supplies, and verdure, but first, those which are lowest, and nearest the Earth, and that require a less Degree of Heat to raise the Water with its earthy Charge into them, then the Shrubs and higher Vegetables in their Turn, and lastly the Trees.

As the Heat increases, it grows too powerful, and hurries the Matter with too great Rapidity through the finer and more tender Plants; these therefore go off and decay, and others, that are more hardy and vigorous, and require a greater Degree of Heat, succeed in their Order. By which Mechanism, provident Nature furnishes us with a very various and different Entertainment, and what is best suited to each Season all the Year round.

As the Heat of the several Seasons affords us a different Face of Things, the several distant Climates shew the

the different Scenes of Nature, and Productions of the Earth.

The hotter Countries, ordinarily yield the largest and tallest Trees, and those too in a much greater Variety than the colder; even those Plants common to both attain to a much greater Bulk in the southern, than in the northern Climates.

Nay, there are some Regions so cold, that they raise no Vegetables at all to a considerable Size, this we learn from Greenland, Iceland, and other Parts of like cold Situation and Condition; in these there are no Trees, and the Shrubs are poor, little, and low.

Again, in the warmer Climates, and such as furnish Trees and the large Vegetables, if there happen a Remission or Diminution of the usual Heat, their Productions are impeded in Proportion. Our own Summers give us Proof enough of this, for though at such Times there is Heat sufficient to raise the vegetative Matter into the lower Plants, as Wheat, Barley, Peas, and the like, and we have Plenty of Strawberries, Raspberries, Gooseberries, Currants, and the Fruits of such Vegetables as are low, and near the Earth, and a moderate Store of Cherries, Plumbs, &c. and some others, that grow at something of a greater Height, yet our Apples, Pears, Peaches, Nectarines, and Grapes, and the Production of warmer Countries, have been fewer, and those not so thoroughly ripened, and brought to Perfection as they are in more benign Seasons.

Nor is it that Heat only which promotes Vegetation, but any other indifferently, according to its Power and Degree, as we find from our Stoves, hot Beds, &c.

And by the rightly adapting of these artificial Heats, the English Gardeners have of late Years so much improved their Art, as in a great Measure to supply the Want of natural Heat, and to vie with the People, who inhabit Countries several Degrees South of England, in the early Products of esculent Plants, and the accelerating and ripening the Fruits of the warmest Climates. And as the Knowledge of Vegetation is improved, and the Practitioners of the Art are better acquainted with the Theory, it may be hoped the Art may be farther extended and improved; therefore it is highly necessary, that the Theory of Vegetation should be studied by every Person who proposes to make any Proficiency in Gardening and Agriculture.

VELLA. Lin. Gen. Pl. 714. Spanish Crefs.

The Characters are,

The Empalement of the Flower is cylindrical, and composed of 4 linear obtuse Leaves which drop off. The Flower has 4 Petals placed in Form of a Cross, whose Tails are the Length of the Empalement, and six Stamina of the same Length, 2 of which are a little shorter, terminated by single Summits, and an oval Germen, supporting a conical Style, crowned by a single Stigma. The Germen afterward turns to a globular Capsule with 2 Cells, divided by an intermediate Partition twice as large as the Pod, and is oval and erect, stretching beyond the Capsule, each Cell containing 1 Seed.

The Species are,

1. VELLA foliis pinnatifidis, filiculis pendulis Lin. Sp. Pl. 641. Vella with Wing-pointed Leaves, and hanging Pods. *Nasturtium sylvestre* Valentinum. Clus. Hist. 2. p. 130. Wild Crefs of Valentia.

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2. VELLA foliis integris filiculis erectis. Lin. Sp. Pl. 641. Vella with entire Leaves, and erect Pods. *Pseudocytisus flora laucii-lutao*. C. B. P. 230. Bastard Cytisus with a Flower like the yellow Wall Flower.

The 1st Sort grows naturally in Valencia; it is an annual Plant, which seldom rises more than 1 Foot high. The Stalk divides toward the Top, into several Branches, each ending in a loose Spike of Flowers, which are followed by round swelling Pods, having a leafy Border or Crest on the Top, which is hollowed like a Helmet. The Pod opens with 2 Valves, and has 2 Cells which contain roundish Seeds, like those of Mustard. The Leaves are jagged, and end in many Points.

This Plant is preserved in Gardens for Variety, but as it is not very beautiful, nor of any Use, it is seldom cultivated unless in Botanic Gardens. If the Seeds of this Plant are permitted to scatter, the Plants will come up, and thrive very well; or if they are sown in Autumn, they will succeed much better than those sown in the Spring; for when the Season proves dry, those Seeds which are sown in the Spring frequently lie in the Ground till the following Autumn, before the Plants appear; whereas those which are sown in Autumn, always come up soon after, or early in the Spring, so will more certainly produce ripe Seeds. These Plants should not be transplanted, therefore the Seeds should be sown where the Plants are to remain, and if they are kept clean from Weeds, and thinned where they are too close, they will require no other Culture.

The 2d Sort grows naturally in Spain. The Leaves of this are entire, hairy, and sit close to the Stalk; they are oval, and of a greyish Colour. The Stalks become ligneous; they rise about 2 Feet high, and are terminated by roundish Bunches of pale yellow Flowers, which stretch out in Length; the Flowers have 4 Cross-shaped Petals; and are succeeded by Pods like the former. This Plant will continue 2 or 3 Years; it is propagated by Seeds as the former.

VERATRUM. Tourn. Inst. R. H. 272. Tab. 145. Lin. Gen. Pl. 1013. White Hellebore; in French, *Ellebore blanc*.

The Characters are,

It has hermaphrodite and male Flowers intermixed in the same Spike. The Flowers have no Empalement; they have 6 oblong Spear-shaped Petals which are permanent, and 6 Awl-shaped Stamina sitting on the Point of the Germen, spreading asunder, terminated by quadrangular Summits; they have 3 oblong erect Germina sitting on the Style, which are scarce visible, crowned by a single spreading Stigma. The Germina become 3 oblong, erect, compressed Capsules with 1 Cell, opening on the Inside, including many oblong, compressed, membranaceous Seeds. The male Flowers have the same Characters as the hermaphrodite, but are barren.

The Species are,

1. VERATRUM racemo supradecomposito, corollis erectis. Lin. Sp. Pl. 1044. White Hellebore with a Spike decomposed above, and erect Petals. *Veratrum flore subviridi*. Tourn. Inst. R. H. 273. White Hellebore with a greenish Flower.

2. VERATRUM racemo composito, corollis patentissimis. Lin. Sp. Pl. 1044. White Hellebore with a compound Spike, and very spreading Petals. *Veratrum flore atro-rubente*.

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bente. *Tourn. Inst. R. H.* 273. White Hellebore with a dark red Flower.

3. *VERATRUM racemo simplicissimo, foliis sessilibus.* *Lin. Sp. Pl.* 1044. White Hellebore with a single Spike, and Leaves sitting close to the Stalk. *Veratrum caule simplicissimo, foliis sessilibus.* *Flor. Virg.* 195. White Hellebore with a single Spike.

4. *VERATRUM racemo simplicissimo, corollis patentibus flaminibus longioribus.* White Hellebore with a single Spike of Flowers, spreading Petals, and longer Stamina.

The 1st Sort grows naturally on the Mountains in *Austria, Helvetia, and Greece.* The Root is perennial, and composed of many thick Fibres gathered into a Head; the Leaves are oblong, oval, 10 Inches long, and 5 broad in the Middle, and rounded at the Points, having many longitudinal Plaits like those of Gentian; the Stalks rise 3 or 4 Feet high, and branch out on every Side almost their whole Length; under each of these Branches is placed a narrow plaited Leaf, which diminishes in its Size as it is nearer the Top of the Stalk. The Branches and principal Stalk are terminated by Spikes of Flowers set very close together, which are composed of 6 Petals which stand erect; these are green, and in their Center is situated 3 obtuse Germina. From the Point of these arise 6 Stamina which spread asunder, and are terminated by four-cornered Summits. These appear in *June and July*, and are each succeeded by oblong compressed Capsules with 1 Cell, filled with membranaceous Seeds.

The 2d Sort grows naturally in *Hungary and Siberia*; it has a perennial Root like the former. The Leaves are longer and thinner than those of the first Sort; they are plaited in the like Manner, but are of a yellowish green Colour, and appear sooner in the Spring; the Stalks rise higher than those of the former. It has fewer Leaves upon it, and does not branch out into so many Spikes: The Flowers of this are of a dark red Colour, and the Petals spread open flat, in which it differs from the former. This flowers almost a Month before the other.

The 3d Sort grows naturally in *Virginia*, and other Parts of *North America*, where it is sometimes called Rattle Snake Root. The Root of this is tuberous and large; the Leaves are oblong, and shaped like those of Plantain, having several longitudinal Furrows or Plaits; they are 4 or 5 Inches long, and 2 broad in the Middle, spreading themselves on the Ground. Between these come out a single Stalk which rises near a Foot high, having a few very small Leaves or Sheaths placed alternately, and at the Top the Flowers are produced in a single, thick, close Spike; they are small, and of a yellowish white Colour; these appear in *June*, but are rarely succeeded by Seeds here.

The 4th Sort was sent me from *Philadelphia* by *Mrs. John Bartram*, who found it growing naturally in that Country. The Root of this is composed of thick fleshy Fibres; the Leaves are oblong, oval, of a light green Colour, having 6 longitudinal Veins or Plaits; they are 4 or 5 Inches long, and between 2 and 3 broad, spreading on the Ground; these are rounded at their Points, and continue all the Year. In the Center of the Leaves springs up a single erect Stalk a Foot high, having a few Vestiges or small Leaves standing alternately close

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to the Stalk, which end in acute Points. The Stalk is terminated by a thick obtuse Spike of dark red Flowers, whose Petals spread open flat. In the Center of the Petals is situated 3 obtuse Germina joined together, from whose Point arise 6 Stamina which spread asunder, and are longer than the Petals; these are terminated by four-cornered Summits of a purple blue Colour. This Plant flowers the latter End of *June*, and in warm Seasons the Seeds will ripen here.

The first of these Plants is that which is ordered for medicinal Use, and is by much the stronger and more acrid Plant of the two; for when both Sorts are placed near each other, the Snails will entirely devour the Leaves of the second Sort, when at the same Time they scarcely touch those of the first.

These Plants are very pretty Ornaments, when planted in the Middle of open Borders of the Pleasure Garden, for if they are placed near Hedges or Walls, where Snails generally harbour, they will greatly deface the Leaves, especially of the second Sort, by eating them full of Holes before they are unfolded, and as a great Part of the Beauty of these Plants is in their broad-folded Leaves, so, when they are thus defaced, the Plants make but an indifferent Appearance.

Both these Sorts may be propagated by parting their Roots in Autumn, when their Leaves decay, but they should not be parted too small, for that will prevent their flowering the following Summer; these Heads should be planted in a light fresh rich Soil, in which they will thrive exceedingly, and produce strong Spikes of Flowers. The Roots should not be removed oftener than once in 3 or 4 Years, by which Time, (if they like the Soil) they will be very strong, and produce many Heads to be taken off, but if they are frequently transplanted, it will prevent their increasing, and cause them to flower very weak.

These Plants may also be propagated by Seeds, which should be sown as soon as ripe, either in a Bed or Box filled with fresh light Earth, and the Ground kept constantly from Weeds. In the Spring the Plants will appear, at which Time, if the Season be dry, you should now and then refresh them with Water, which will greatly promote their Growth, and you must carefully clear them from Weeds, which, if permitted to grow, will soon overspread and destroy these Plants while young. The Autumn following, when their Leaves decay, you should prepare a Bed of fresh light Earth, and carefully take up the young Plants (observing not to break their Roots), and plant them therein about 6 Inches square, where they may remain until they are strong enough to flower, when they should be transplanted into the Borders of the Pleasure Garden; but, as these Plants seldom flower in less than 4 Years from Seed, this Method of propagating them is not much practised in *England*.

The two *American* Sorts are at present rare in the *English* Gardens, but, as they are hardy enough to thrive in the open Air, in a few Years they may become plenty; these may be propagated by Offsets or Seeds, as the former.

VERBASCUM. *Tourn. Inst. R. H.* 146. *Tab.* 61. *Lin. Gen. Pl.* 217. Mullein; in *French* Bouillon blanc.

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The Characters are,

The Flower has a small permanent Empalement of 1 Leaf, cut into 5 Parts; it hath 1 Wheel-shaped Petal, with a very short cylindrical Tube, the Brim spreading, and cut into 5 oval obtuse Segments, and 5 Awl-shaped Stamina, shorter than the Petal, terminated by roundish, compressed, erect Summits, with a roundish Germen, supporting a slender Style inclining to the Stamina, crowned by a thick obtuse Stigma. The Germen afterward becomes a roundish Capsule with 2 Cells, opening at the Top, having a half oval Receptacle fixed to the Partition, and filled with angular Seeds.

The Species are,

1. VERBASCUM foliis decurrentibus utrinque tomentosis. Vir. Cliff. 13. Mullein with running Leaves woolly on both Sides. *Verbascum mas latifolium luteum*. C. B. P. 239. Great white Mullein, Hig Taper, or Cows-lungwort.

2. VERBASCUM foliis cuneiformi oblongis. Hort. Ups. 45. Mullein with oblong Wedge-shaped Leaves. *Verbascum pulverulentum, flore luteo parvo*. J. B. Hoary Mullein with small yellow Flowers.

3. VERBASCUM foliis cordato-oblongis, subtus incanis, spicis racemosis. Mullein with oblong Heart-shaped Leaves hoary on their under Side, and branching Spikes of Flowers. *Verbascum femina, flore albo*. C. B. P. 239. Female Mullein with a white Flower.

4. VERBASCUM foliis radicalibus ovatis petiolatis, caulinis oblongis sessilibus subtus tomentosis serratis. Mullein with oval lower Leaves growing on Foot Stalks, but those on the Stalks oblong, sawed, woolly on their under Side, and sitting close. *Verbascum blattaria foliis nigrum, amplioribus foliis luteis, apicibus purpurascens*. Flor. Leyd. Boerb. Ind. alt. 1. 228. Mullein with black Mullein Leaves, large yellow Petals to the Flower, and purple Summits.

5. VERBASCUM foliis ovato-acutis utrinque tomentosis, floribus in spica densissima sessilibus. Haller. Helvet. 507. Mullein with oval acute-pointed Leaves woolly on both Sides, and Flowers disposed in thick Spikes sitting close to the Stalk. *Verbascum femina, flore luteo magno*. C. B. P. 239. Female Mullein with a large yellow Flower.

6. VERBASCUM foliis serratis superne rugosis, inferne subhirsutis, petiolis ramosis, staminum barba purpurascens. Haller. Helvet. 511. Mullein with sawed Leaves whose upper Sides are rough, those on the under Side hairy, branching Foot Stalks, and purplish Beards to the Stamina. *Verbascum nigrum, flore ex luteo-purpurascens*. C. B. P. 240. Black Mullein, with a yellowish purple Flower, commonly called Sage-leaved black Mullein.

7. VERBASCUM foliis radicalibus oblongis sinuatis undatis tomentosis, caulinis cordatis amplexicaulibus nudiusculis. Lin. Sp. Pl. 178. Mullein with the lower Leaves oblong, sinuated, woolly, and waved, and those on the Stalks Heart-shaped, embracing the Stalks with their Base, and almost naked. *Verbascum nigrum, folio papaveris corniculati*. C. B. P. 240. Black Mullein with a horned Poppy Leaf.

8. VERBASCUM foliis amplexicaulibus oblongis glabris, pedunculis solitariis. Hort. Ups. 46. Mullein with oblong smooth Leaves embracing the Stalks, and single Foot Stalks to the Flowers. *Blattaria alba*. C. B. P. 241. White Moth Mullein.

9. VERBASCUM foliis radicalibus pinnato-sinuatis, cau-

linis dentatis acuminatis semi-amplexicaulibus, pedunculis solitariis. Mullein with the lower Leaves jagged like Wings, those on the Stalks acute pointed, indented, and half embracing the Stalks, and single Foot Stalks to the Flowers. *Blattaria lutea, folio longo, laciniato*. C. B. P. 240. Yellow Moth Mullein with a long jagged Leaf.

10. VERBASCUM foliis ovato-oblongis obsolete crenatis, utrinque virentibus petiolatis, caule ramofo. Mullein with oblong oval Leaves having obsolete Crenatures, and both Sides green with a branching Stalk. *Blattaria flore ferrugineo*. H. R. Par. Moth Mullein with an Iron-coloured Flower.

11. VERBASCUM foliis radicalibus oblongis integerrimis, utrinque viridibus, caulinis acutis sessilibus, pedunculis aggregatis. Mullein with oblong entire lower Leaves green on both Sides, those on the Stalks acute-pointed and sitting close, and clustered Foot Stalks. *Blattaria annua, flore majore luteo, capsula item majore*. Mor. Hist. 2. p. 498. Annual Moth Mullein with a larger yellow Flower, and a larger Capsule.

12. VERBASCUM foliis ovatis nudis crenatis radicalibus, caule subnudo racemofo. Lin. Sp. Pl. 178. Mullein with naked, oval, crenated, lower Leaves, and an almost naked branching Stalk. *Blattaria purpurea*. C. B. P. 241. Purple Moth Mullein.

13. VERBASCUM foliis lanatis radicalibus, scapo nudo. Lin. Sp. Pl. 179. Mullein with woolly lower Leaves, and a naked Stalk. *Verbascum humile Alpinum villosum borraginis flore & folio*. Tourn. Inst. 147. Low, hairy, Alpine Mullein, with the Leaf and Flower of Borage, commonly called Borage-leaved Auricula.

The 1st is the common Mullein or Hig Taper which is used in Medicine; this grows naturally by the Side of Highways and on Banks in most Parts of England; it is a biennial Plant which perishes soon after it has perfected Seeds. The lower Leaves, which spread on the Ground, are 9 or 10 Inches long, and 6 broad; they are very woolly, and of a yellowish white Colour, having scarce any Foot Stalks. The Stalk rises 4 or 5 Feet high, and the lower Part is garnished with Leaves, shaped like those below but smaller, whose Base half embraces the Stalk, and have Wings running along the Stalk from one to the other. The upper Part of the Stalk is closely garnished with yellow Flowers, sitting very close, formed into a long thick Spike; these are composed of 5 obtuse roundish Petals, having 5 Stamina in the Center; they have an agreeable Odour. It flowers in July, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in some Parts of England; I have observed it in Plenty in some Parts of Nottinghamshire: This is a biennial Plant. The lower Leaves are oblong, indented on their Edges, and end in acute Points. The Stalk rises 3 or 4 Feet high, sending out from every Joint short Spikes of small yellow Flowers, which are paler than those of the first, and have a pleasanter Odour. At the Base of each Spike is situated a small, oblong, acute-pointed Leaf; these are covered with a white Powder which washes off. When the Flowers decay, they are succeeded by oval Capsules, filled with small Seeds, which ripen in Autumn.

The 3d Sort grows naturally in Italy and Spain. The lower Leaves of this are more than a Foot long, and 5 or 6 Inches broad, rough on their upper Side, and a lit-

the hoary; their under Side is pale and very hoary. The Stalk rises 6 or 7 Feet high sending out some Side Branches which are erect; the Flowers are disposed in long Spikes which are branched; they are white, and sometimes yellow, having the most agreeable Scent of all the Species. This flowers about the same Time with the former, and the Seeds ripen in Autumn.

The 4th Sort has oval Leaves, a Foot long, and 6 Inches broad, in the Middle, standing on thick Foot Stalks; they are of a soft Texture, of a pale green on their upper Side, but hoary on their under, having many prominent Nerves. The Stalk rises 3 or 4 Feet high; the lower Part is garnished with smaller Leaves of the same Shape with those below; the upper Part is garnished with pale yellow Flowers, disposed in a loose Spike, having small Leaves intermixed with the Flowers the whole Length. This flowers and ripens its Seeds about the same Time with the former.

The 5th Sort has oval Leaves which terminate in a Point; they are of a yellowish green Colour, and woolly on both Sides. The Stalks rise about 4 Feet high; they are of a purplish Colour, covered with a hoary Down. The Flowers sit very close to the Stalk, forming a very thick Spike, having no Leaves between them; they are much larger than those of the first Sort, and are of a deeper yellow Colour. It flowers and ripens its Seeds about the same Time as the former.

The 6th Sort grows naturally in several Parts of England. The lower Leaves of this are Spear-shaped, and rounded at the Foot Stalk, where they are indented like a Heart; they are of a pale green on their upper Side, and hoary on their under, indented on their Edges; those upon the Stalk are oblong, acute-pointed, and sawed. The Stalks rise 3 or 4 Feet high, the upper Part ending in a loose Spike of yellow Flowers, which are formed in short Spikes or Clusters on the Side of the principal Stalk; these have purplish Stamina which are bearded; they have an agreeable Odour at a small Distance, but, if smelt too near, become less agreeable.

The 7th Sort grows naturally in Italy and Greece, and also on the Rocks at Gibraltar. The lower Leaves are oblong, sinuated on their Borders, a little waved and hoary. The Stalk rises 4 or 5 Feet high, sending out many slender Branches; the lower Part of the Stalk is garnished with Heart-shaped Leaves whose Base embraces the Stalk; the upper Part of the Stalk and Branches have no Leaves, but the Flowers are disposed along their Sides in small Clusters at Distances; they are small, yellow, and have little Odour.

The 8th Sort grows naturally in the South of France and Italy. The Leaves of this are oblong, smooth, and of a dark green Colour; the Stalk rises 3 or 4 Feet high, and sends out 2 or 3 Side Branches; they are garnished with oblong, smooth, green Leaves, whose Base embraces the Stalk. The Flowers come out singly from the Side of the Stalk, on Foot Stalks an Inch long; they have 1 Petal cut into 5 obtuse Segments almost to the Bottom; they are white within, and have a little Blush of red on the Outside. The Seed Vessels of this Sort are round, and filled with small Seeds. This flowers about the same Time as the former Sorts.

The 9th Sort grows naturally in some Parts of Eng-

land; this differs from the former, in the lower Leaves being much longer; they are also deeply sinuated on their Edges, in a regular Manner, in Imitation of the Rangement of the Lobes of winged Leaves; they are of a brighter green Colour than those of the former. The Stalks rise much taller; the Flowers are of a bright yellow Colour, and the Stamina which are hairy, are of a purple Colour.

The 10th Sort is commonly cultivated in Gardens here, and is commonly known by the Title of Iron-coloured Moth Mullein; this has a perennial Root, in which it differs from all the former Sorts, though there are some who suppose it to be only a Variety of the last mentioned, but it differs greatly from that in other Respects. The Bottom Leaves are oblong, oval a little crenated on their Edges, but are entire; they are of a dark green on their upper Side, and of a pale green on their under, standing on pretty long Foot Stalks. The Stalk rises 3 or 4 Feet high, branching out on each Side, and has a few sharp-pointed small Leaves on the lower Part sitting close to the Stalk. The Flowers are disposed in a long loose Spike on the upper Part of the Stalk; they come out on short slender Foot Stalks, 3 or 4 from the lower Joints; above those there are 2 at each Joint, and at the Top they are single; these are of 1 Petal, cut almost to the Bottom into 5 obtuse Segments; they are of a rusty Iron Colour, and are larger than those of the common Sort. This Plant flowers in July and August, but does not produce Seeds here.

The 11th Sort grows naturally in Sicily, from whence the Seeds were sent me; this is a biennial Plant which perishes soon after the Seeds are ripe. The lower Leaves of this are 10 Inches long, and 2 and a Half broad rounded at their Points; they are entire, and of a deep green on both Sides. The Stalk is strong, and rises 5 or 6 Feet high; it is garnished with small acute pointed green Leaves, whose Base sits close to it. The Flowers form a very long loose Spike at the Top; they stand on slender Foot Stalks which come out in Clusters from the Side of the Stalk; they are large of a deep yellow Colour, and are succeeded by large round Capsules which are brown, opening in two Parts, and filled with small dark-coloured Seeds. It flowers in July and August.

The 12th Sort grows naturally in Spain and Portugal. The Root of this is perennial; the Leaves are oval, and of a light green Colour; they are entire, and a little hairy; the Stalk rises 3 Feet high, and is almost naked of Leaves; but the Flowers are ranged along it almost the whole Length, standing on short Foot Stalks, which for the most part come out single. The Flowers are of a dark blue inclining to purple; these appear in June and July, but are not succeeded by Seeds here.

The 13th Sort grows naturally on the Alps and Pyrenean Mountains; this is a very humble Plant, whose Leaves spread on the Ground. The Roots of this are composed of slender Fibres; the Leaves are thick, fleshy, and hairy; they are oval, crenated on their Edges, and have compressed hairy Foot Stalks; these are spread flat on the Ground. Between them arise slender naked Foot Stalks, about 4 Inches long, which divide into 3 or 4 small ones at the Top, each sustaining 1 large blue Flower composed of 5 oval Petals which spread open flat, and 5 thick erect Stamina which stand erect.

This

This flowers in May, and, after the Flowers are past, the Germen turns to an oblong-pointed Capsule which opens in 2 Parts, and is filled with small Seeds.

The Root of this is perennial, and the Plant is usually propagated by Offsets which come out from the Side of the old Plant; these should be taken off in Autumn, and planted in small Pots filled with light sandy Earth; they must always have a shady Situation, for they will not thrive when they are exposed to the Sun.

The first 9. and the 11th Sorts are biennial Plants; these may be all cultivated by sowing their Seeds in August, on a Bed of light Earth, in an open Situation, where the Plants will come up the succeeding Month, and will endure the Winter's Cold very well, provided they have a dry Soil. In February the Plants should be transplanted where they are to remain, allowing them a greater Distance, for as they grow pretty tall and large, they must not be planted nearer than 2 Feet. In June following they will flower, and their Seeds will be ripe in August or September; but notwithstanding some of these Plants grow wild in England, yet 2 or 3 of each Kind may be admitted into large Gardens, for the Variety of their hoary Leaves, together with the extreme Sweetness of their Flowers, which have a Scent somewhat like Violets; and, as they require little Care, they may be allowed a Place in the Borders of large Gardens, where during their Continuance in flower, they will add to the Variety, and, if their Seeds are permitted to scatter, will come up without Care, but the 7th Sort seldom produces good Seeds in England.

The 10th and 12th Sorts have perennial Roots, and, as they do not produce good Seeds here, they are propagated by Offsets; these should be taken off in Autumn, Time enough to get good Root before Winter, otherwise they will not flower the following Summer. These Plants thrive best in a sandy Loam, and should be planted on an East Border, where they may have only the Morning Sun, for they do not thrive well when they are too much exposed to the Sun.

VERBENA. Tourn. Inst. R. H. 200. Tab. 94. Lin. Gen. Pl. 30. Vervain.

The Characters are,

The Flower has an angular, tubulous, permanent Empalement of 1 Leaf, indented in 5 Parts at the Brim; it has 1 Petal with a cylindrical Tube the Length of the Empalement which is incurved, and cut into 5 Points at the Brim which spread open, and are nearly equal; it has 4 very short bristly Stamina within the Tube, 2 of which are shorter than the other, with as many incurved Summits as Stamina, or half that Number, with a four-cornered Germen, supporting a slender Style the Length of the Tube, crowned with an obtuse Stigma. The Germen afterwards becomes 2 or 4 oblong Seeds closely shut up in the Empalement.

The Species are,

I. VERBENA tetrandra, spicis filiformibus paniculatis, foliis multifido-laciniatis, caule solitario Lin. Sp. Pl. 20. Vervain with 4 Stamina, slender Spikes disposed in Panicles, Leaves having many pointed Jags, and a single Stalk. Verbena communis, caeruleo flore. C. B. P. 269. Common Vervain with a blue Flower.

2. VERBENA tetrandra, spicis longis acuminatis, foliis hastatis. Hort. Ups. 8. Vervain with 4 Stamina to the

Flowers, long acute-pointed Spikes, and Spear-shaped Leaves. Verbena Americana, spicâ multiplici, foliis urtica angustissimis. floribus caeruleis. Prod. Par. Bat. American Vervain with many Spikes of blue Flowers, and narrow Nettle Leaves.

3. VERBENA tetrandra, spicis filiformibus solitariis, foliis bipinnatifidis. Lin. Sp. Pl. 21. Vervain with 4 Stamina to the Flowers, single slender Spikes, and double Wing-pointed Leaves. Verbena tenuifolia. C. B. P. 269. Narrow-leaved Vervain.

4. VERBENA tetrandra, spicis filiformibus paniculatis, foliis indivisis serratis petiolatis. Hort. Ups. 9. Vervain with 4 Stamina to the Flowers, slender Spikes growing in Panicles, and undivided sawed Leaves having Foot Stalks. Verbena urtica folio Canadensis. H. R. Par. Canada Vervain with a Nettle Leaf.

5. VERBENA tetrandra, spicis filiformibus, foliis multifido laciniatis, caulibus numerosis. Hort. Ups. 8. Vervain with 4 Stamina to the Flowers, slender Spikes, Leaves with many jagged Points, and numerous Stalks. Verbena urtica folio Canadensis foliis incisissimis flore majore. H. R. Par. Nettle-leaved Vervain of Canada, with cut Leaves and a larger Flower.

6. VERBENA tetrandra, spicis fasciculatis, foliis lanceolatis amplexicaulibus. Hort. Ups. 8. Vervain with 4 Stamina to the Flower, Spikes disposed in Bunches, and Spear-shaped Leaves embracing the Stalks. Verbena Bonariensis altissima, lavendulae Canariensis, spicâ multiplici Hort. Elth. 406. Tallest Vervain of Buenos Ayres with many Spikes like the Canary Lavender.

7. VERBENA tetrandra spicis filiformibus paniculatis, foliis inferne cordato oblongis caulibus lanceolatis serratis petiolatis. Vervain with 4 Stamina to the Flowers, slender Spikes growing in Panicles, the under Leaves oblong and Heart-shaped, and those on the Stalks Spear-shaped, sawed, and having Foot Stalks.

8. VERBENA tetrandra spicis capitato-conicis, foliis serratis, caule repente. Flor. Zeyl. 399. Vervain with 4 Stamina to the Flowers, Spikes growing in conical Heads, sawed Leaves and a creeping Stalk. Sberardia repens, folio subrotundo crasso, nodiflora. Vaill. Serm. Creeping Sberardia with roundish thick Leaves, and Flowers collected in Knots.

9. VERBENA diandra, spicis longissimis carnosissimis subnudis. Lin. Sp. Pl. 19. Vervain with 2 Stamina to the Flowers, and very long fleshy Spikes almost naked. Verbena folio subrotundo serrato, flore caeruleo. Sloan. Hist. 171. Vervain with roundish sawed Leaves, and a blue Flower.

10. VERBENA diandra, spicis carnosissimis subnudis, foliis ovatis obtusis, obsolete crenatis petiolatis. Vervain with 2 Stamina to the Flowers, fleshy Spikes almost naked, and oval obtuse Leaves growing on Foot Stalks, and having worn out Indentures. Sberardia Americana, verbenae folio subrotundo crasso, floribus caeruleis spicâ longissimâ & crassissimâ. Millar. American Sberardia with a thick roundish Vervain Leaf, blue Flowers, and a very long thick Spike.

II. VERBENA diandra, spicis longissimis foliosis. Lin. Sp. Pl. 18. Vervain with 2 Stamina to the Flowers, and the longest leafy Spikes. Sberardia urtica folio subrotundo, floribus violaceis. Ebr. Tab. 5. f. 1. Sberardia with a Nettle Leaf which is hoary on the under Side, and a Violet-coloured Flower.

12. *VERBENA diandra, spicis brevioribus, foliis ovatis serratis, subtus incanis.* Vervain with 2 Stamina to the Flowers, shorter Spikes, and oval sawed Leaves hoary on their under Side.

13. *VERBENA diandra spicis ovatis, foliis lanceolatis serrato-plicatis, caule fruticoso.* Prod. Leyd. 327. Vervain with 2 Stamina to the Flowers, oval Spikes and Spear-shaped Leaves, which are sawed and plaited, and a shrubby Stalk. *Sberardia nodiflora, stæchadis serratifolii folio.* Vaill. Serm. 48. *Sberardia* with a knotted Flower, and a Leaf like that of the sawed-leaved *Stæchas*.

14. *VERBENA diandra, spicis rotundis, foliis ovatis serratis, caule fruticoso ramoso.* Vervain with 2 Stamina to the Flowers, round Spikes, oval sawed Leaves, and a shrubby branching Stalk. *Sberardia nodiflora, fruticosa, foliis subrotundis serratis.* Houst. Mss. Shrubby *Sberardia* with a knotted Flower, and roundish sawed Leaves.

15. *VERBENA diandra, spicis carnosis subnudis, foliis lineari lanceolatis obsolete serratis.* Vervain with 2 Stamina to the Flowers, naked fleshy Spikes, and narrow Spear-shaped Leaves, with worn out sawed Edges. *Sberardia spicata, folio angusto serrato, flore cæruleo.* Houst. Mss. *Sberardia* with spiked blue Flowers, and a narrow sawed Leaf.

16. *VERBENA diandra, spicis laxis, calycibus fructus reflexo-pendulis subglobosis hispidis.* Lin. Sp. Pl. 19. Vervain with 2 Stamina to the Flowers, loose Spikes, the Empalement of the Fruit almost globular, prickly, and reflexed downward. *Verbena Mexicana, trachelii folio, fructu aparines.* Hort. Elth. 407. Mexican Vervain with a Throatwort Leaf, and Fruit like Clivers.

17. *VERBENA diandra, spicis laxis, calycibus aristatis, foliis ovatis argutè serratis.* Lin. Sp. Pl. 19. Vervain with 2 Stamina to the Flowers, loose Spikes, bearded Empalements, and oval Leaves sharply sawed. *Kempferia frutescens, chamædryos folio, floribus spicatis cæruleis.* Houst. Mss. Shrubby *Kempferia* with a Germander Leaf, and blue spiked Flowers.

18. *VERBENA diandra, spicis ovatis, foliis subrotundis serratis & rugosis, caule fruticoso ramoso.* Vervain with 2 Stamina to the Flowers, oval Spikes, roundish, sawed, rough Leaves, and a shrubby branching Stalk. *Sberardia arborescens nodiflora foliis serratis & rugosis flore purpureo.* Houst. Mss. Tree-like *Sberardia* with a purple Flower, and rough sawed Leaves.

The 1st here mentioned is very common on the Side of Roads and Foot Paths near Habitations: for although there is scarce any Part of England, in which this Plant is not found in Plenty, yet it is never found growing above a Quarter of a Mile from a House; which occasioned its being called *Simpler's Joy*, because where ever this Plant is found growing, it is a sure Token of a House being near; this is a certain Fact, but not easy to be accounted for. It is rarely cultivated in Gardens, but is the Sort directed by the College of Physicians for medicinal Use; and is brought to the Markets by those who gather it in the Fields.

There is another Species which approaches near to this, but is taller, the Leaves are broader, and the Flowers larger. It came from Portugal, and is by *Tournefort* titled *Verbena Lusitanica, latifolia procerior.* Inst. R. H. 200. Taller, broad-leaved Portugal Ver-

vain. But I am in some Doubt of its being specifically different from the common Sort, though the Plants in the Garden grow much taller than that, and the Flowers are larger, yet as there is so near an Affinity, I cannot be sure they are different.

The 2d Sort grows naturally in most Parts of North America; this sends up many four-cornered furrowed Stalks from the Root, which rise 5 or 6 Feet high, garnished with oblong Leaves, about 3 Inches long, and 1 broad near the Base, ending in acute Points, they are deeply sawed on their Edges, and stand on slender Foot Stalks by Pairs; and from the same Joints come out short Branches, set with smaller Leaves of the same Form. The Stalks are terminated by Spikes of blue Flowers in Clusters, which appear in August, and if the Autumn proves favourable, the Seeds will ripen the Middle of October.

The 3d Sort grows naturally in Spain and Portugal; this is a biennial Plant which perishes soon after the Seeds are ripe. The Stalks rise near 2 Feet high, and branch out greatly. The Leaves are double Wing-pointed, and sit close to the Stalks. The Flowers are disposed in long loose Spikes, singly, at the End of the Branches; they are of a light blue Colour, and larger than those of the common Sort. It flowers in July and August, and the Seeds ripen in Autumn.

The 4th Sort grows naturally in most Parts of North America; this is a biennial Plant. The Stalks are four cornered, and rise about 3 Feet high. The Leaves are 3 Inches long, and 1 broad in the Middle, ending in acute Points; they are sawed on their Edges, and are placed by Pairs. The Stalks are terminated by Panicles of Spikes, which are long, slender, and sustain small white Flowers, ranged loosely; these appear in July, and are succeeded by Seeds which ripen in Autumn.

The 5th Sort grows naturally in North America; this is a biennial Plant, whose Bottom Leaves are 6 Inches long, deeply jagged on their Sides, and sawed on their Edges; they are rough, and of a deep green Colour. The Stalks rise 2 Feet high, and are garnished at the Joints with two smaller Leaves of the same Shape, placed opposite. The upper Part of the Stalk branches out into numerous Foot Stalks, which sustain Panicles of spiked blue Flowers; these appear in July and August, and if the Season proves favourable, the Seeds will ripen in Autumn.

The 6th Sort grows naturally at Buenos Ayres; this has four-cornered Stalks, which rise to the Height of 5 or 6 Feet, sending out Branches by Pairs from the Side; they are garnished with Spear-shaped Leaves, three Inches long, and about 3 Quarters of an Inch broad, whose Base embraces the Stalks; they are of a pale green Colour, and are sawed on their Edges. The Stalks are terminated by Spikes of blue Flowers, which are clustered together. The longest Spikes are about 2 Inches, the other are about half so long; these appear late in Summer, so are rarely succeeded by good Seeds in England.

The 7th Sort grows naturally at Philadelphia. The Seeds of this were sent me by Dr. *Benfel*: this is a perennial Plant. The lower Leaves are Heart-shaped and rough; they are 5 Inches long, and 3 and a Half broad

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broad near their Base, ending in acute Points, they are of a dark green Colour, and are sawed on their Edges. The Stalks rise 6 Feet high, they are four cornered, and branch toward the Top, and are terminated by slender Spikes of white Flowers, formed into Panicles; these appear late in Autumn, so that unless the Season proves favourable, the Seeds do not ripen here.

The 8th Sort grows naturally in *Virginia*, and also in *Jamaica*; from the latter the late Dr. *Houssoun* sent me the Seeds. The Stalks of this trail on the Ground, and emit Roots from their Joints, whereby they spread, and propagate greatly, and from these arise other Branches about 8 or 9 Inches high, garnished with oval Spear-shaped Leaves, placed opposite; these are about 1 Inch long, and half an Inch broad, sawed on their Edges, and sit close to the Stalks. The Flowers are collected in conical Heads, standing on long naked Foot Stalks, which spring from the Wings of the Branches, they are of a yellowish white Colour, and come late in Autumn, so are rarely succeeded by good Seeds here.

The 9th Sort grows naturally in most of the Islands in the *West-Indies*; this is an annual Plant. The Stalk rises a Foot and a Half high, and is garnished with oblong oval Leaves placed by Pairs; they are of a light green Colour, and are sawed on their Edges. The Stalk is terminated by a long fleshy Spike of blue Flowers which appear in *July*, and are succeeded by 2 oblong Seeds which ripen late in Autumn. The Spikes of Flowers are from a Foot to a Foot and a Half in Length.

The Seeds of the 10th Sort were sent me from *Panama*, where it grows naturally in moist Places; this is an annual Plant, whose Stalks rise about a Foot high, and are garnished with oval, blunt-pointed, fleshy Leaves, standing on long Foot Stalks; and at the same Joints come out other Stalks sustaining 3 or 4 small Leaves of the same Shape; they are notched slightly on their Edges, and are of a light green Colour. The Stalks are terminated by thick fleshy Spikes of blue Flowers, which appear late in Autumn, so that unless the Season proves warm, the Seeds do not ripen in *England*.

The Seeds of the 11th Sort were sent me from *Panama*, by the late Mr. *Robert Millar*; this rises with a shrubby Stalk near 3 Feet high, which divides into 3 or 4 Branches; these are garnished with oblong oval Leaves placed by Pairs, which are deeply sawed on their Edges; they are of a deep green on their upper Side, but hoary on their under; their Foot Stalks are short, and have leafy Boarders running from the Base of the Leaves. The Flowers grow on thick Spikes, which terminate the Branches, and are about a Foot long. The Flowers are large, and of a fine blue Colour, so make a fine Appearance, and have small acute-pointed Leaves intermixed with them on the Spikes. This Plant flowers in *August*, and when the Season proves warm, the Seeds ripen in Autumn.

The Seeds of the 12th Sort were sent me from *Paris*, and were said to come from *Senegal* in *Africa*; this is a perennial Plant with a branching Stalk, which rises near 2 Feet high, and is garnished with oval sawed Leaves placed by Pairs, which are 2 Inches and a Half long, and almost 2 Inches broad, of a deep green on their

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upper Side, but hoary on their under, and have pretty long Foot Stalks. The Flowers are disposed in fleshy Spikes at the End of the Branches; these Spikes are shorter, and not so thick as those of the former Sorts. The Flowers are small and white, so make no great Appearance; they appear in *June* and *July*, and the Seeds ripen in Autumn, but the Plants may be preserved two or three Years in a warm Stove.

The 13th Sort grows naturally in *Jamaica*, and in several other Places in the *West-Indies*. The Seeds of this were sent me from *La Vera Cruz*, by the late Dr. *Houssoun*; this rises with a shrubby branching Stalk 4 or 5 Feet high. The Branches are adorned with Spear-shaped Leaves, 2 Inches long, and Half an Inch broad, sawed on their Edges: the Teeth of the Jaggs coming from the Point of a Fold or Plait in the Leaf; these stand by Pairs on short Foot Stalks. The Flowers stand on long naked Foot Stalks, which arise from the Wings of the Stalk; they are blue and are collected in oval Heads; these appear late in Autumn, and unless the Season proves warm, the Seeds rarely ripen in *England*, but the Plants may be kept 2 or 3 Years in a warm Stove.

The 14th Sort was found growing naturally at *Campesby* by the late Dr. *Houssoun*, who sent the Seeds to *England*; this has a shrubby branching Stalk, which rises 3 or 4 Feet high. The Branches are garnished with oval sawed Leaves set on by Pairs; they are of a light green Colour, about an Inch and a Half long, and near an Inch broad. The Flowers are of a pale blue Colour, collected into oval Heads, which stand on long naked Foot Stalks, springing from the Wings of the Branches; these flower late in Autumn, and are not succeeded by Seeds in *England*.

The 15th Sort grows naturally at *La Vera Cruz*, from whence the late Dr. *Houssoun* sent the Seeds; this is an annual Plant with a branching Stalk, which rises a Foot and a Half high, garnished with pale green Leaves, 3 Inches and a Half long, and half an Inch broad, ending in acute Points, and are slightly sawed on their Edges. The Branches are terminated by fleshy Spikes of blue Flowers which are naked; these appear in *August*, and in warm Seasons are succeeded by Seeds which ripen in Autumn.

The 16th Sort grows naturally in *Mexico*; this has a shrubby Stalk which rises 5 or 6 Feet high, and divides into several Branches, garnished with oblong sawed Leaves which end in acute Points; they are 2 Inches long, and 1 broad near their Base, sitting close to the Branches; they are of a light green Colour on both Sides. The Branches are terminated by slender loose Spikes of pale Flowers which are very small, whose Empalements afterward become close, swelled, and almost globular; they are reflexed downward, and are set with stinging Hairs. It flowers late in the Summer, and in good Years the Seeds ripen in *England*.

The Seeds of the 17th Sort were sent me from *La Vera Cruz*, by the late Dr. *Houssoun*; this has a slender ligneous Stalk which branches out on each Side, and rises near 3 Feet high; the Branches are adorned with small oval Leaves, sharply indented on their Edges; they are of a light green Colour, and stand on short Foot Stalks. The Flowers stand sparsely on slender Foot Stalks.

Stalks arising from the Wings of the Branches; these are naked, 6 or 7 Inches in Length, and toward the Top the Flowers are ranged at a Distance from each other in a loose Spike; they are small, and of a bright blue Colour, sitting very close; these are succeeded by 2 Seeds inclosed in the Empalement, which is terminated by short Awns or Beards. This Plant has flowered in the Chelsea Garden, but did not produce Seeds.

The 18th Sort was discovered by the late Dr. Hous-
ton growing naturally at Campeachy, from whence he sent the Seeds to England; this has a strong woody Stalk, which rises 10 or 12 Feet high, covered with a light brown Bark, and sends out many ligneous Branches on every Side, garnished with roundish, sawed, rough Leaves of a light green Colour, standing on short Foot Stalks. The Flowers are small, of a pale blue Colour, and are collected into oval Heads, standing on naked Foot Stalks, which spring from the Wings of the Branches; these seldom appear in this Country, and are not succeeded by Seeds here; but the Plants are easily propagated by Cuttings during the Summer Months, and may be preserved many Years in a moderate Stove.

The 1st Sort, as was before observed, being a common Weed in England, is not kept in Gardens.

The 3d Sort may be easily propagated by Seeds which should be sown in Autumn, and requires no other Culture than to keep it clean from Weeds, and thin the Plants where they are too close.

The 4th and 5th Sorts may also be propagated in the same Manner, and are equally hardy. If the Seeds of these 3 Sorts are permitted to scatter, the Plants will come up the following Spring.

The 2d and 7th Sorts have perennial Roots, and are hardy enough to thrive in the open Air; these may be propagated by Seeds, which should be sown in Autumn, for when they are sown in the Spring, they rarely grow the same Year; these Plants require no other Culture but to keep them clean from Weeds, and allow them proper Room to spread; they may also be propagated by parting their Roots in Autumn. They love a soft loamy Soil not too dry.

The other Sorts being Natives of warmer Climates, require more Care. The Seeds of these should be sown on a hot Bed early in the Spring, and when the Plants are fit to remove, they should be each transplanted into a separate small Pot, and plunged into a fresh hot Bed to bring them forward; they must be shaded in the Day Time with Mats until they have taken new Root, then they must be treated as other tender Plants from the same Countries.

Those Sorts which are annual must be removed into the Stove, or a good Glass Case; when they are become too tall to remain longer under the Frames; for if they are placed abroad in the open Air, they will not ripen their Seeds here, unless the Summer is very warm; and where there is a Convenience of having a Bark Bed in a Glass Case, for plunging some of these tender annual Plants, they will thrive much better, and come to greater Perfection, than those which are placed on Shelves.

The Sorts which are perennial may be kept in such a Glass Case till Autumn, allowing them a large Share of

Air in warm Weather, to prevent their drawing up weak; and they should be transplanted into larger Pots, as they increase in their Size, but this must be done with Caution, for if they are put into Pots too large, they will not thrive.

The 17th Sort is by much the tenderest Plant of all the Species, and is very difficult to preserve when young. The Seeds of this should be sown in a small Pot, and plunged into a good hot Bed of Tanners Bark. When the Plants appear they should be shaded from the Sun in the Heat of the Day. They must be frequently refreshed with Water, but it must be given to them sparingly, for much Wet will kill them. When they are transplanted into small Pots, they must be carefully shaded till they have taken new Root, and they must be constantly kept in the Bark Bed.

VERBESINA. Lin. Gen. Plant. 873. Eupatoriophalacron. Vaill. Ad. Par. 1720.

The Characters are,

The common Empalement of the Flower is concave, and composed of a double Order of Leaves which are channelled. The Flower is made up of hermaphrodite Florets in the Disk, and female half Florets in the Border or Rays. The hermaphrodite Florets are funnel-shaped, and cut into 5 Parts at the Brim; they have 5 very short hair-like Stamina, terminated by cylindrical Summits, and a Germen the same Figure as the Seed, supporting a slender Style, crowned by 2 reflexed Stigmas. The Germen afterward becomes a thick angular Seed crowned by a few three-pointed Chaff. The female half Florets are stretched out on one Side in Shape of a Tongue, which form the Rays; these have no Stamina, but have a Germen, Style, and two Stigmas like the hermaphrodite Florets, and are succeeded by Seeds like those.

The Species are,

1. VERBESINA foliis alternis ducurrentibus undulatis obtusis. Hort. Cliff. 411. Verbesina with alternate running Leaves, obtuse and waved. Bidens Indica hieracii folio caule alato. Tournef. Inst. 462. Indian Water Hemp Agrimony with a Hawkweed Leaf, and a winged Stalk.

2. VERBESINA foliis oppositis lanceolatis serratis. Hort. Cliff. 500. Verbesina with Spear-shaped sawed Leaves, placed opposite. Eupatoriophalacron balsamine femine folio, flore albo discoide. Vaill. Ad. Par. 1719. Eupatoriophalacron with a female Balsamine Leaf, and a white discous-shaped Flower.

3. VERBESINA foliis oppositis ovatis trinerviis glabris petiolatis, feminibus tricornuis. Flor. Zel. 310. Verbesina with oval three-veined Leaves placed opposite, having Foot Stalks and Seeds with three Horns. Eupatoriophalacron scrophulariae aquaticae foliis oppositis. Burm. Zeyl. 94. Eupatoriophalacron with Leaves like those of the Water Betony and placed opposite.

4. VERBESINA foliis oppositis lanceolatis integerrimis, caulibus procumbentibus, floribus sessilibus. Verbesina with Spear-shaped entire Leaves, placed opposite, trailing Stalks, and flowers sitting close to the Branches. An? Verbesina foliis oppositis lanceolatis serratis, floribus alternis geminis subsessilibus. Lin. Sp. Pl. 902. Verbesina with opposite Spear-shaped sawed Leaves, and double Flowers which are placed alternate, and sit close to the Stalk.

5. VERBESINA foliis oppositis lanceolatis argute dentatis,

st. caule erecto ramoso piloso. Verbesina with Spear-shaped, acutely indented Leaves placed opposite, and an erect, branching, hairy Stalk. *Eupatoriophalacron foliis angustis rariis dentatis, flore radiato. Vaill. Art. Par. 1720. Eupatoriophalacron* with narrow Leaves, which are rarely indented, and a radiated Flower.

6. *VERBESINA foliis oppositis cordatis acuminatis dentatis trinerviis, pedunculis nudis longioribus. Verbesina* with Heart-shaped, acute-pointed, indented, three-veined Leaves placed opposite, and longer naked Foot-Stalks to the Flowers. *Eupatoriophalacron Americanum scrophulariae acutius folio, disco luteo prominente stipato, vix radiato. Act. Phil. Lond. 422. American Eupatoriophalacron* with an acuter Figwort Leaf, and a prominent yellow Disk to the Flower having scarce any Rays.

There are several other Species of this Genus, which grow naturally in both *Indies*, but are seldom preserved in Gardens, so they are omitted here lest the Work should swell too large.

The 1st Sort grows naturally in most of the Islands of the *West-Indies*; it is an annual Plant with an upright winged Stalk about 2 Feet high, from the Sides of which spring out toward the Top, a few short Branches. The Leaves are oval, blunt, and waved on their Edges; they are 3 Inches and a half Long, and 2 broad, and are placed alternate; from the Base of each Leaf is extended a leafy Border running along 2 Sides of the Stalk, so that it is winged the whole Length. The Flowers stand on long naked Foot Stalks arising from the Top and the Wings of the Stalk; they are of a deep Orange Colour, and are composed of hermaphrodite and female Florets included in one common spherical Empalement, and are both fruitful; these are succeeded by broad, compressed, bordered Seeds with 2 Teeth, which ripen in the Empalement. This Plant begins to flower in *July*, and continues till the Frost kills the Plants.

The 2d Sort grows naturally in the *West-Indies*; this has an upright branching Stalk a Foot and a Half high. The Leaves are Spear-shaped, about 2 Inches long, and three Quarters broad, a little sawed on their Edges, fitting close to the Stalk opposite. The Flowers arise from the Wings of the Stalk, on slender Foot Stalks 2 Inches long, three, four or more springing from the same Joint; each of these sustain one white radiated Flower, composed of many Florets, which are succeeded by oblong black Seeds. It flowers at the same Time with the former.

The 3d Sort grows naturally in both *Indies*; this rises with an upright branching Stalk, 2 or 3 Feet high. The Leaves are oval, acute-pointed, and smooth, having 3 longitudinal Veins; they stand opposite on pretty long Foot Stalks. The Flowers spring from the Wings and Ends of the Branches; they are yellow and stand on short Foot Stalks. It flowers about the same Time with the former.

The 4th Sort grows naturally in *India*; this has trailing Stalks which spread on the Ground; they extend 2 Feet or more in Length, and put out Roots from their Joints, sending out many side Branches. The Leaves are 2 Inches long, and half an Inch broad, smooth and entire. The Flowers are very Small and white; these

fit close to the Stalks at the Base of the Leaves. They appear at the same Time with the former.

The 5th Sort grows naturally in the *West-Indies*; this has a purplish, hairy, branching Stalk, which rises a Foot and a Half high. The Leaves are 3 Inches long, and 3 Quarters of an Inch broad, ending in acute Points; they have a few sharp Indentures on their Edges, and stand opposite. The Flowers are white, standing on slender Foot Stalks an Inch long, which spring from the Wings of the Stalk, sometimes single, and at others 2 or 3 at the same Joint. It flowers at the same Time with the former.

The 6th Sort grows naturally in the *West-Indies*; the Stalks of this branch out their whole Length, and are declining downward. The Leaves are smooth, Heart-shaped, and have 3 Veins; they are 2 Inches and a Half long, and one and a Quarter broad near their Base, indented on their Edges, and stand opposite. The Flowers stand on long naked Foot Stalks, which spring from the Wings of the Branches; they are of a yellow Colour, and have oblong prominent Disks, with a few very small Rays. This flowers at the same Time with the former.

These Plants are propagated by Seeds which should be sown on a moderate hot Bed in the Spring, and when the Plants are fit to remove, they should be transplanted on a fresh hot Bed to bring them forward; they must be shaded till they have taken new Root; then they must be treated as other tender annual Plants, being careful not to draw them up too weak. In *June* they may be taken up with Balls of Earth and planted in a warm Border where they must be shaded and watered till they have taken new Root, after which they will require little Care. These will produce good Seeds in Autumn; but they may be kept through the Winter in a Stove.

VERONICA. Tourn. Inst. R. H. 143. Tab. 60. Lin. Gen Pl. 25. Male Speedwell, or Fluellin; in French, Veronique.

The Characters are,

The Flower has a permanent Empalement cut into 5 acute Segments; it has 1 Petal with a Tube the Length of the Empalement; the Brim is cut into 4 oval plain Segments which spread open, and 2 Stamina which are rising, terminated by oblong Summits, with a compressed Germen supporting a slender declining Style, crowned by a single Stigma. The Germen becomes a compressed Heart-shaped Capsule, with 2 Cells, filled with roundish Seeds.

The Species are,

1. *VERONICA spicis lateralibus pedunculatis, foliis oppositis, caule procumbente. Lin. Mat. Med. 11. Speedwell with Spikes of Flowers growing on Foot Stalks, and springing from the Sides of the Stalks. Leaves placed opposite, and a trailing Stalk. Veronica mas supina & vulgatissima. C. P. B. 246 Common male Speedwell, or Fluellin.*

2. *VERONICA spicis terminalibus, foliis oppositis linearibus lanceolatis subserratis. Speedwell with Spikes of Flowers terminating the Stalks, and narrow Spear-shaped Leaves placed opposite, and somewhat sawed. Veronica spicata angustifolia. C. B. P. Narrow-leaved Spiked Speedwell.*

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3. *VERONICA spicis terminalibus, foliis oppositis lanceolatis serratis acuminatis* Hort. Upsal. 7. Speedwell with Spikes of Flowers terminating the Stalks, and acute-pointed sawed Leaves, which are Lance-shaped, and placed opposite. *Veronica major latifolia erecta*. Mor. Hist. 2. p. 317. Greater broad-leaved upright Speedwell.
4. *VERONICA spica terminali, foliis oppositis crenatis obtusis, caule ascendente simplicissimo*. Lin. Sp. Pl. 10. Speedwell with a Spike of Flowers terminating the Stalk, obtuse crenated Leaves placed opposite, and a single ascending Stalk. *Veronica spicata minor*. C. B. P. 247. Smaller spiked Speedwell.
5. *VERONICA spicis lateralibus paniculatis, foliis ovatis inaequaliter crenatis sessilibus*. Speedwell with Spikes of Flowers proceeding in Panicles from the Wings of the Stalk, and oval Leaves which are unequally notched, and sit close. *Veronica multicaulis pannonica*. Tourn. Inst. 145. Hungarian Speedwell having many Stalks, or Spikes of Flowers.
6. *VERONICA spicis terminalibus, foliis oppositis obtusis serratis scabris, caule erecto*. Lin. Sp. Pl. 11. Speedwell with Spikes of Flowers terminating the Stalk, rough, obtuse, sawed Leaves, placed opposite, and an erect Stalk. *Veronica spicata Cambro-Britannica, bugulae subbirsuto folio*. Raii Syn. Edit. 3. 278. Welsh spiked Speedwell, with a hairy Bugle Leaf.
7. *VERONICA spicis terminalibus, foliis quaternis quinifve*. Lin. Sp. Pl. 9. Speedwell with Spikes of Flowers terminating the Stalks, and 4 or 5 Leaves at each Joint. *Veronica Virginiana altissima, spica multiplici, floribus candidis*. Flor. Bat. Tall Virginian Speedwell with many Spikes, and white Flowers.
8. *VERONICA spicis terminalibus, foliis ternis aequaliter serratis*. Hort. Ups. 7. Speedwell with Spikes of Flowers terminating the Stalks, and Leaves growing by Threes which are equally sawed. *Veronica spicata longifolia*. Tourn. Long-leaved spiked Speedwell.
9. *VERONICA spicis terminalibus, foliis ternis inaequaliter serratis*. Lin. Sp. Pl. 10. Speedwell with Spikes of Flowers terminating the Stalks, and Leaves growing by Threes, which are unequally sawed. *Veronica foliis saepius ternis*. Vir. Cliff. 2. Speedwell with Leaves generally growing by Threes.
10. *VERONICA spicis terminalibus, foliis oppositis crenatis, caule erecto*. Speedwell with Spikes of Flowers terminating the Stalks, crenated Leaves growing opposite, and an erect Stalk. *Veronica mas erecta*. C. B. P. 246. Male upright Speedwell.
11. *VERONICA spicis lateralibus pedunculatis laxis, foliis oppositis linearibus argute dentatis*. Speedwell with loose Spikes of Flowers growing on Foot Stalks, and springing from the Wings of the Stalk, and very narrow Leaves placed opposite, and sharply indented. *Veronica Austriaca, foliis tenuissimis laciniosis*. Inst. R. H. Austrian Speedwell with Leaves finely jagged.
12. *VERONICA spicis terminalibus, foliis pinnato-incisis acuminatis*. Speedwell with Spikes of Flowers terminating the Stalks, and acute-pointed Leaves cut in the Form of Wings. *Veronica orientalis minima, foliis laciniosis*. Tourn. Cor. 7. The least eastern Speedwell having jagged Leaves.

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13. *VERONICA racemis lateralibus, foliis cordatis rugosis dentatis, caule stricto*. Lin. Sp. Pl. 13. Speedwell with Spikes of Flowers proceeding from the Wings of the Stalk, rough, Heart-shaped, indented Leaves, and a strait Stalk. *Veronica maxima*. Lugd. The greatest Speedwell, or false Germander.
 14. *VERONICA spicis terminalibus, foliis oppositis crenatis obtusis, caule erecto tomentoso*. Hort. Ups. 7. Speedwell with Spikes of Flowers terminating the Stalks, crenated obtuse Leaves placed opposite, and an erect woolly Stalk. *Veronica spicata lanuginosa & incana, floribus caeruleis*. Amman. Ruth. 30. Hoary, woolly, spiked Speedwell with blue Flowers.
 15. *VERONICA spicis longissimis lateralibus pedunculatis, foliis oppositis inaequaliter serratis*. Speedwell with the longest Spikes of Flowers springing from the Wings of the Stalk, and growing on Foot Stalks, and Leaves placed opposite which are unequally sawed. *Veronica major frutescens altera*. Mor. Hist. 2. p. 319. Another greater shrubby Speedwell.
 16. *VERONICA racemis lateralibus, foliis ovatis planis, caule repente*. Flor. Suec. 11. Speedwell with lateral Spikes of Flowers, oval plain Leaves, and a creeping Stalk. *Veronica aquatica major, folio subrotundo*. Mor. Hist. 3. 323. Greater Water Speedwell, with a roundish Leaf, commonly called Brooklime.
- There is a much greater Number of Species of this Genus than are here enumerated, several of which grow naturally in England, but, as they are rarely admitted into Gardens, it is beside the Intention of this Work to mention them.
- The 1st Sort grows wild in Woods, and other shady Places, in divers Parts of England, and is a Plant of little Beauty; but, as it is the Sort which is used in Medicine, under the Title of *Paul's Betony*, I thought it necessary to insert it here. This is a low Plant whose Stalks trail on the Ground, and put out Roots from their Joints, whereby it spreads and propagates. The Leaves are oval, about an Inch long, sawed on their Edges, and are placed opposite. The Flowers are disposed in Spikes which arise from the Wings of the Stalk; they are small, of a pale blue Colour, and have 1 Petal which is cut at the Brim into 4 Segments; they appear in June, and when they decay, the German turns to a Capsule, not unlike that of Shepherd's Pouch in Shape, filled with small Seeds which ripen in August.
- This is generally brought to Market by such Persons as make it their Business to gather Herbs in the Fields, so that it is not often cultivated in Gardens; but those who have a Mind to propagate it, may do it with much Ease, for as the Branches trail on the Ground, they push out Roots from their Joints, which Branches, being cut off, and planted, will take Root, and grow in almost any Soil or Situation. The whole Herb is used in Medicine, and is one of the Wound Herbs which are brought from Switzerland. A Tea of this Herb is much recommended for the Gout and Rheumatism.
- The 2d Sort grows naturally in Italy and Spain; this has a perennial Root which sends out many Offsets, by which it is easily propagated. The lower Leaves of this are 2 Inches long, and half an Inch broad, of a pale green Colour, and hairy; the Stalks rise a Foot high;

high; they are garnished with very narrow Spear-shaped Leaves placed opposite, which have a few slight Serratures on their Edges. The Stalks are terminated by long Spikes of blue Flowers which appear in *June* and *July*; these are succeeded by Seeds which ripen in Autumn. It has been doubted if this was specifically different from the common upright Speedwell, but I have many Times propagated this by Seeds, and have always found the Plants, so raised, maintain their Difference. There is a Variety of this with a Flesh-coloured Flower.

The 3d Sort grows naturally in *Austria* and *Hungary*. The lower Leaves of this are 2 Inches long, and 1 broad in the Middle, drawing to a Point at each End; they are sawed on their Edges, and are of a lucid green Colour. The Stalks rise a Foot and a Half high, and are garnished with Leaves of the same Shape with the lower, but smaller, and placed opposite; they are terminated by long Spikes of blue Flowers which appear in *June*, and are succeeded by flat Seed Vessels filled with compressed Seeds which ripen in Autumn.

The 4th Sort grows naturally in the northern Parts of *Europe*, and in *England* it grows in several Closets near *Newmarket* Heath. The lower Leaves of this are about an Inch and a Half long, and three Quarters of an Inch broad; they are of a pale green Colour, and notched on their Edges. The Stalks rise a Foot and a Half high; they do not branch; the Leaves on the lower Part stand opposite, but on the upper Part they are alternate; the Stalks are terminated by short Spikes of blue Flowers, which appear about the same Time as the former.

The 5th Sort grows naturally in *Hungary*. The lower Leaves of this are an Inch and a Half long, and three Quarters of an Inch broad, and are unequally notched; the Stalks rise a Foot high, and are garnished with the same Sort of Leaves placed opposite; these are of a lucid green, and sit close to the Stalks. The Flowers are disposed in paniced Spikes, which stand on long naked Foot Stalks that spring from the upper Wings of the Stalk; they are larger than those of the other Species, and are of a beautiful blue Colour, so make a fine Appearance, but are of short Duration. This Sort flowers the Beginning of *June*.

The 6th Sort grows naturally on the *Alps* and *Pyrenean* Mountains, and also on the Mountains in *Wales*. The lower Leaves of this are rough and hairy; they are 3 Inches long, and one and a Half broad, blunt-pointed, and obtusely sawed on their Edges, standing on pretty long Foot Stalks; the Stalks grow erect about 6 Inches high, and are garnished with oval notched Leaves placed opposite. From the Side of the Stalk spring out 2 or 3 Branches, which toward the Bottom are garnished with small Leaves placed opposite, but terminate in long Spikes of pale blue Flowers. The Spikes on these Side Branches are 4 or 5 Inches long, but those of the principal Stalk are eight or nine. This Sort flowers in *June* and *July*.

The 7th Sort grows naturally in *Virginia*. The Stalks of this Sort are erect, and rise 4 or 5 Feet high, garnished at each Joint by 4 or 5 Spear-shaped Leaves which stand round the Stalk in Whorls; these are sawed

on their Edges, and end in acute Points. The Stalks are terminated by long slender Spikes of white Flowers, which appear late in *July*; these are succeeded by compressed Capsules filled with Seeds, which ripen in Autumn.

The 8th Sort grows naturally in *Italy* and the South of *France*. The Stalks of this rise 3 Feet high, and are garnished with Leaves placed by Fours toward the Bottom, but at the Top by Threes at each Joint; they are 3 Inches long, and half an Inch broad, deeply sawed on their Edges, ending in acute Points, and are of a bright green Colour; they are terminated by Spikes of blue Flowers, which appear in *June* and *July*. The Seeds ripen in Autumn.

The ninth Sort grows near the Sea in several Parts of *Europe*. The Stalks of this do not rise so high as those of the former; the Leaves are placed by Fours and Threes round the Stalk, and have longer Foot Stalks; they are broader at the Base, and run out into long acute Points; they are unequally sawed on their Edges, and are of a bright green Colour. The Flowers are disposed in Spikes which terminate the Stalks, are of a bright blue Colour, and appear in *July*. The Seeds ripen in Autumn.

The tenth Sort grows naturally in many Parts of *France* and *Germany*. The Stalks of this are single, and do not branch; they are round, hairy, and rise a Foot and a Half high; these are garnished with Spear-shaped Leaves two Inches long, and one broad in the Middle, notched on their Edges, and hairy. The Stalk is terminated by a long Spike of blue Flowers, which appear in *June* and *July*.

The eleventh Sort grows naturally in *Austria*. The lower Leaves of this are narrow, and cut into fine Segments; the Stalks are slender, and incline downward; they are garnished with linear Leaves which are acutely notched on their Edges; the Flowers are disposed in long loose Spikes, which spring from the Wings of the Stalk; they are of a bright blue Colour, and stand upon Foot Stalks. This flowers the End of *May* and the Beginning of *June*.

The twelfth Sort grows naturally in the *Levant*; this has slender branching Stalks which decline, and are garnished with narrow Leaves which are acutely cut on their Edges; these are regular on both Edges like the Lobes of winged Leaves; they are of a pale green Colour, and smooth. The Flowers are disposed in loose Spikes on the Top and the Side of the Stalks; they are of a pale blue Colour, and appear the End of *April*.

The 13th Sort grows naturally on Mount *Baldus* in *Italy*. The Stalks of this are slender, stiff, and upright; these are garnished by rough Heart-shaped Leaves, which are indented and placed opposite; those on the lower Part of the Stalk are small; in the Middle they are much larger, and diminish again in their Size toward the Top. The Flowers come out in long Bunches from the Wings of the Stalk toward the Top; they are of a bright blue Colour, and appear in *May*.

The 14th Sort grows naturally in the *Ukraine Tartary*. The Stalks of this are very white and woolly; they rise about a Foot high, and are garnished with oblong hoary Leaves placed opposite; they are 2 Inches and a Half long, three Quarters of an Inch broad, notched

on their Edges, and sit close to the Stalks, which are terminated by Spikes of deep blue Flowers, and from the Wings of the Stalk toward the Top are produced slender Spikes of the like Flowers which stand erect. This flowers in June and July.

The 15th Sort grows naturally in *Austria* and *Bobemia*. The Stalks are slender, about a Foot and a Half long, inclining downward; the Leaves are nearly oval, but are acute-pointed, about an Inch long; they are unequally sawed, and sit close to the Stalks. The Flowers are disposed in long loose Spikes on Foot Stalks, arising from the Wings of the Stalk; those on the lower Part of the Stalk are 8 or 9 Inches long. The Flowers are of a bright blue Colour, and appear in May; the Leaves of this Sort are frequently variegated with yellow.

The 16th Sort is the common Brooklime which grows naturally in Brooks and Streams of Water in most Parts of *England*, so is not cultivated in Gardens, but as it is much used in Medicine, I have given it a Place here. The Stalks of this are thick, succulent, and smooth, emitting Roots from their Joints, whereby they spread and propagate. The Leaves are oval, flat, succulent, and smooth; they stand opposite; the Flowers come out in long Bunches from the Wings of the Stalk; they are of a fine blue Colour, and stand on short Foot Stalks; these appear great Part of Summer, and are succeeded by Heart-shaped Seed Vessels filled with roundish Seeds. The whole Herb is used, and is esteemed an excellent Antiscorbutick.

These Plants may all be propagated by parting their Roots, which may be done every other Year, for if they are not often parted or divided, they will many of them grow too large for the Borders of small Gardens; but yet they should not be parted into very small Heads, because when they have not a Number of Stems, so as to form a good Bunch, they are soon past their Beauty, and have but a mean Appearance. The best Time to part these Roots is at *Michaelmas*, that they may be well rooted again before Winter, for when they are removed in the Spring, they seldom flower strong the same Year, especially if the Season should prove dry. Those Sorts, which grow pretty tall, are very proper to plant on the Sides of open Wilderness Quarters, but those with trailing Branches are fit for the Sides of Banks or irregular shady Slopes, where they will make an agreeable Variety; they are all of them very hardy, so are in no Danger of suffering by Cold, and require no other Care but to keep them clean from Weeds, and to be transplanted every second or third Year.

They may be propagated by Seeds, which should be sown in Autumn; for when they are sown in the Spring, the Plants rarely come up the same Year; but, as most of the Sorts propagate very fast by their Offsets, their Seeds are seldom sown.

If these Plants are placed in a shady Border, they will thrive much better than when they are more exposed to the Sun, and their Flowers will continue much longer in Beauty.

VIBURNUM, *Lin. Gen. Pl.* 332. Under this Genus is included the *Viburnum*, *Tinus*, and *Opulus* of *Tournefort*. The Wayfaring or pliant Meally Tree:

The Characters are,

The Flower has a small permanent Empalement cut into 5 Parts; it has 1 Bell-shaped Petal cut at the Brim into 5 obtuse Segments which are reflexed; it has 5 Awl shaped Stamina, the Length of the Petal, terminated by roundish Summits, and a roundish Germen, situated under the Flower, having no Style, but the Place is occupied by a roundish Gland, and crowned by 3 obtuse Stigmas. The Germen turns to a roundish Fruit, with 1 Cell, inclosing 1 hard roundish Seed.

The Species are,

1. **VIBURNUM foliis cordatis serratis venosis subtus tomentosis.** *Vir. Cliff.* 25. Wayfaring Tree with Heart-shaped, sawed, veined Leaves, woolly on their under Side. *Viburnum. Math.* 217. The Wayfaring, or pliant Meally Tree of *Italy*.

2. **VIBURNUM foliis ovatis serratis venosis subtus tomentosis.** Wayfaring Tree with oval, sawed, veined Leaves, woolly on their under Side. *Viburnum. Park. Theat.* 1448: The English Wayfaring Tree.

3. **VIBURNUM foliis subrotundis crenato-serratis glabris.** *Flor. Virg.* 33. Wayfaring Tree with roundish crenated, sawed Leaves, which are smooth. *Mespilus prunifolia Virginiana, non spinosa, fructu nigricante.* *Pluk. Alm.* 249. *Virginia* Haw with a Plum Leaf having no Thorns, and a black Fruit, commonly called Black Haw, and by some Sheeps Turds.

4. **VIBURNUM foliis ovato-orbiculatis profunde serratis venosis.** Wayfaring Tree with oval round Leaves, deeply sawed and veined. *An? Viburnum foliis ovatis dentato-serratis.* *Lin. Sp. Plant.* 268. Wayfaring Tree with oval, indented, sawed Leaves.

5. **VIBURNUM foliis ovatis integerrimis, ramificationibus subtus villosis-glandulosis.** *Lin. Sp. Pl.* 267. Wayfaring Tree with oval entire Leaves, whose Branches are hairy, and glandulous on the under Side. *Tinus prior. Clus. Hist.* 49. Hairy-leaved *Laurustinus*.

6. **VIBURNUM foliis ovato-lanceolatis integerrimis, utrinque virentibus lucidis.** Wayfaring Tree with oval Spear-shaped Leaves which are entire, shining, and green on both Sides. *Tinus 2d. Clus. Hist.* 50. The shining-leaved *Laurustinus*.

7. **VIBURNUM foliis ovato-lanceolatis integerrimis, subtus venosis.** Wayfaring Tree with oval Spear-shaped Leaves which are entire, and veined on their under Side. *Tinus foliis ovatis in petiolis terminatis integerrimis.* *Flor. Virg.* 33. *Tinus* with oval Leaves which are entire, and terminate in a Foot Stalk.

8. **VIBURNUM foliis lobatis petiolis glandulosis.** *Lin. Sp. Pl.* 268. Wayfaring Tree with Leaves divided into Lobes, and glandulous Foot Stalks. *Opulus Ruell.* 281. *Guelder* Rose with flat Flowers.

9. **VIBURNUM foliis cordato-ovatis acuminatis serratis, petiolis longissimis laevibus.** Wayfaring Tree with Heart-shaped, oval, acute-pointed, sawed Leaves growing upon very smooth Foot Stalks. *Opulus Americana, foliis acuminatis & serratis, floribus albis.* *Dale.* *American Guelder* Rose with acute-pointed sawed Leaves, and white Flowers.

The 1st Sort grows naturally in *Italy* and the warm Parts of *Europe*, and is the common *Viburnum* or *Lantana* of the old Botanists. The Leaves of this Tree are Heart-shaped, 9 Inches long, and 4 Inches and a Half

Half broad; they are much veined, and irregularly sawed on their Edges, and are very woolly on their under Side. The Stalks are woody, and rise 12 or 14 Feet high, sending out strong ligneous Branches on every Side, covered with a light coloured Bark; these are terminated by Umbels of white Flowers whose Summits are red. The Flowers appear in *June*, and are succeeded by roundish compressed Berries, which turn first to a bright red Colour, and are black when ripe, inclosing one Seed of the same Shape.

The 2d Sort is our common *English Viburnum* or Wayfaring Tree, which has been generally thought the same Species with that of the other Countries in *Europe*, but is different. The Leaves of this are oval, about 4 Inches long, and 3 broad; they are not so woolly as those of the former. The Branches are weaker; they are not so downy, and are less regular; the Umbels of Flowers are smaller; the Berries are less, and the Seeds are more compressed than those of the other: These Differences are permanent in the Plants which are propagated by Seeds. It flowers about the same Time with the former; it grows naturally on dry chalky Land.

There is a Variety of this with variegated Leaves, preserved in some of the Gardens near *London*, but when the Plants are removed into good Ground, and are vigorous, their Leaves become plain.

The 3d Sort grows naturally in most Parts of *North America*, where it is commonly called Black Haw; this rises with a woody Stalk, 10 or 12 Feet high, covered with a brown Bark, and sends out Branches from the Side the whole Length; these, when young, are covered with a purple smooth Bark; they are garnished with oval smooth Leaves, 2 Inches long, and an Inch and a Quarter broad, which are slightly sawed on their Edges, and stand on short slender Foot Stalks, sometimes opposite, and at others without Order. The Flowers are disposed in small Umbels, which come out from the Side and at the End of the Branches; they are white, and smaller than those of the common *Viburnum*; these appear in *June*, and are sometimes succeeded by Berries which do not ripen here.

The 4th Sort grows naturally in *North America*. The Stalks of this are soft and pithy; they branch out greatly from the Bottom upward. The Bark is of a gray Colour; the Leaves are roundish, oval, three Inches long, and nearly as broad; they are strongly veined, and sawed on their Edges, of a light green Colour, and placed opposite upon pretty long Foot Stalks. The Flowers are disposed in a Corymbus at the End of the Branches; they are white, and almost as large as those of the common Sort; these appear the latter End of *June*, but are not succeeded by Seeds in *England*.

The 5th Sort is the *Laurustinus* with small Leaves which are hairy on their under Side; this Plant is so well known as to need no Description, but as it is frequently confounded with the next, it may be necessary to point out its Difference. The Leaves of this are seldom more than 2 Inches and a Half long, and one and a Quarter broad; they are rounded at their Base, but end in acute Points; they are veined and hairy on their under Side, and are not of so lucid a green Colour on their upper Side. The Umbels of Flowers are smaller, and

appear in *Autumn*, continuing all the Winter, and the Plants are much hardier.

The 6th Sort is commonly known in the Nursery Gardens by the Title of shining-leaved *Laurustinus*. The Stalks of this rise higher, and the Branches are much stronger than those of the former Sort. The Bark is smoother, and turns of a purplish Colour; the Leaves are larger, of a thicker Consistence, and of a lucid green Colour; the Umbels are much larger, and so are the Flowers; these seldom appear till the Spring, and when the Winters are sharp, the Flowers are killed, so never open unless they are sheltered. The Plants of this Sort were formerly kept in Tubs, and housed in Winter, and, when they were so treated, made a fine Appearance early in the Spring, and in very mild Seasons the Plants in the open Air do the same.

There is a Variety of this with variegated Leaves, which makes as good a Figure as any of the striped Plants which are preserved in Gardens.

The 7th Sort is a Native of *North America*, where it rises to the Height of 10 or 12 Feet, sending out Branches on every Side their whole Length; these have a smooth purplish Bark; they are garnished with oval entire Leaves, 5 Inches long, and 2 Inches and a Half broad, of a thick Consistence, and a lucid green; they stand opposite. The Flowers are produced in Umbels at the End of the Branches; they are white, and not unlike the Flowers of *Laurustinus*; these appear in *July*, and are succeeded by Berries which seldom ripen in *England*.

There seems to be two Sorts of this in the Gardens, one of which comes from the more northern Parts of *America*, and sheds its Leaves in Winter; the other, which grows in *Carolina* and *Virginia*, is an Ever-green, but both are so much alike in Summer, as scarce to be distinguished.

The 8th Sort is the common Marsh Elder, which grows naturally in marshy Grounds, and on the Sides of Rivers in many Parts of *England*, so is not often kept in Gardens; it is called by some of the Nursery Gardeners *Guelder Rose* with flat Flowers to distinguish it from the other whose Flowers are globular. The Marsh Elder is the original Species, and *Guelder Rose* is a Variety which accidentally arose from it. The former has a Border of male Flowers which are large, and the Middle of the Umbel is composed of hermaphrodite Flowers which are succeeded by oval red Berries; the latter has all male Flowers of the same Size and Shape with those of the Border of the first, so that they swell out into a round Figure, which has occasioned some Country People giving it the Title of Snowball Tree. This Sort is cultivated in Gardens for the Beauty of its Flowers, which make a fine Appearance during their Continuance.

It will rise to the Height of 18 or 20 Feet, if it is permitted to stand. The Stem becomes large, woody, and hard; the Branches come out opposite, and are apt to grow irregular; they have a gray Bark. The Leaves are placed opposite; they are divided into 3 or 4 Lobes, somewhat like those of the Maple; they are about 3 Inches long, and two and a Half broad, jagged on their Edges, and of a light green Colour.

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The Flowers come out at the End of the Branches; those of the first in large Umbels, and those of the second in a Corymbus; they are very white, and appear the Beginning of June; those of the first have oval Berries succeeding the hermaphrodite Flowers, which turn of a scarlet Colour when ripe, but the other, having only male Flowers, is barren.

The 9th Sort grows naturally in *Carolina* and some other Parts of *North America*; this rises with a shrubby Stalk, 8 or 10 Feet high, sending out many Side Branches covered with a smooth purple Bark, and garnished with Heart-shaped oval Leaves, ending in acute Points; they are deeply sawed on their Edges, have many strong Veins, and stand on very long slender Foot Stalks opposite. The Flowers are collected into large Umbels at the End of the Branches; those ranged on the Border are male and barren, but the Middle is composed of hermaphrodite Flowers, which are succeeded by oval Berries. The Flowers are white, and the Berries are red when ripe.

The 2 first Sorts may be propagated either from Seeds, or by laying down the tender Branches, but the former Method, being tedious, is seldom practised, because the Seeds seldom grow the first Year, unless they are sown in Autumn, and as the Branches easily put out Roots, that is the more expeditious Method.

The best Time for laying these Branches is in Autumn, just as the Leaves begin to fall (the Manner of laying them, being the same as for other hardy Trees, need not be here repeated). By the succeeding Autumn the Layers will be rooted, when you may take them off from the old Plants and transplant them into a Nursery for 2 or 3 Years, in which they may be trained up to regular Stems and Heads, and may afterward be planted where they are to remain. The first Sort is full as hardy as the second.

The striped Sort may be propagated by inarching or budding it on the plain Sort; this is preserved by such as delight in variegated Plants, but there is no great Beauty in it. These Trees seldom grow near so large as those of the plain Sort, as is the Case of all other striped Plants.

The 3d Sort is generally propagated by Layers here, because the Seeds do not ripen in *England*. The young Shoots of this take Root very freely; the Cuttings will also take Root, if they are planted in Autumn; the Seeds, when they are brought to *England*, always remain in the Ground a Year like those of the other Sorts, so that the propagating the Plants by Seeds is a tedious Method.

The *Laurustinus* are propagated by laying down their young Branches, which put out Roots very freely, so that when they are layed in Autumn, they will be well rooted by that Time twelve Months, when they should be taken off from the old Plants, and may either be planted where they are to remain, or into a Nursery to grow 2 Years to get Strength. The best Season to transplant these is at *Michaelmas*, that they may get new Root before Winter, for as these Plants begin to flower early in Winter, it is a plain Indication of their growing at that Season, for they will more surely succeed then than at any other Time of the Year, though they may be removed in the Spring with Balls of Earth to their Roots, provided it is done before they begin to

shoot; they may also be removed the latter End of July or the Beginning of August, if Rain happens at that Time, for after they have done shooting, which is soon after *Midsummer*, they will be in no Danger, provided they are not kept out of the Ground any Time.

These Plants may also be propagated by Seeds, which should be mixed with Earth in Autumn, soon after they are ripe; these should be exposed to the open Air, and receive the Rain in Winter, and in the Spring they may be sown on a gentle hot Bed, which will bring up the Plants; these should remain in the Bed till Autumn, and then may be transplanted, and treated as the Layers. I have raised many of these Plants from Seeds, which I find hardier than those raised by Layers.

Some People train up the *Laurustinus* with naked Stems to have round Heads, but if these are planted in the open Air, they will be in more Danger of suffering by severe Frost, than those whose Branches grow rude from the Bottom, for if the Frost kills the outer Part of the Shoots, the Stems will be protected, so will soon put out new Branches, but where the Stems are naked, the Frost frequently kills them to the Root.

The 7th Sort may be propagated as the *Laurustinus*, and requires the same Treatment; it loves a soft loamy Soil, and should have a sheltered Situation.

The 8th and 9th Sorts are easily propagated by Layers or Cuttings. The common *Guelder Rose* sends out Plenty of Suckers from the Roots, by which it is frequently propagated, but as the Plants so raised are very subject to put out Suckers, they are not so good as those which come from Layers or Cuttings. Both these Sorts love a moist Soil, in which they will make much greater Progress, and produce their Flowers in greater Plenty than on a dry Soil.

They are both very hardy, so will thrive in the coldest Situations, but not within the Spray of the Sea. The common *Guelder Rose* is seldom suffered to stand very long in Gardens, but I have seen one in an old Garden whose Stem was more than two Feet and a Half round.

VICIA. *Tourn. Inst. R. H.* 396. *Tab.* 221. *Lin. Gen. Plant.* 782. Vetch; in *French*, *Vesse*.

The Characters are,

The Flower has an erect tubulous Empalement of 1 Leaf, cut into 5 equal Parts at the Brim; the Petal is of the Butterfly Kind; the Standard is oval, broad at the Tail, indented at the Point, and the Borders are reflexed; the 2 Wings are almost Heart-shaped, and are shorter than the Standard; the Keel is shorter than the Wings, the Tail is oblong, and divided into 2 Parts. It has 10 Stamina, 9 joined and 1 separated, terminated by erect Summits with 4 Furrows, and a linear, compressed, long Germen, supporting a slender Style crowned by an obtuse Stigma, which is bearded on the under Side. The Germen afterward turns to a long Pod, with 1 Cell opening with 2 Valves, and ending with an acute Point, containing several roundish Seeds.

The Species are,

1. *VICIA pedunculis multifloris floribus imbricatis, foliis lanceolatis pubescentibus, stipulis integris. Lin. Sp. Pl.* 735. Vetch with many imbricated Flowers on a Foot Stalk, Spear-shaped hairy Lobes to the Leaves, and entire Stipulæ. *Vicia multiflora* C. B. P. Many-flowered Vetch.

2. *VICIA*

2. *VICIA pedunculis multifloris, foliis ovalibus stipulis denticulatis*. Lin. Sp. Pl. 734. Vetch with Foot Stalks supporting many Flowers, oval Lobes to the Leaves, and indented Stipulae. *Vicia sylvatica, multiflora, maxima*. Pby. Britt. The largest many-flowered Wood Vetch.

3. *VICIA pedunculis subsexfloris, foliis denis ovatis acutis, stipulis integris*. Lin. Sp. Pl. 735. Vetch with Foot Stalks having about 6 Flowers, Leaves with 10 oval acute Lobes, and entire Stipulae. *Vicia multiflora Cassubica frutescens, siliqua lentis*. Breyn. Prod. 52. Many-flowered shrubby Vetch of Cassubia with a Lentil Pod.

4. *VICIA pedunculis multifloris, petiolis sulcatis, subdodecaphyllis, foliis lanceolatis glabris*. Lin. Sp. Pl. 736. Many-flowered Vetch with furrowed Foot Stalks, and for the most part twelve Spear-shaped smooth Lobes to each Leaf.

5. *VICIA leguminibus sessilibus subinnatis erectis, foliis retusis, stipulis notatis*. Lin. Sp. Pl. 736. Vetch with erect Pods growing by Pairs, and sitting close to the Stalks, blunt Lobes to the Leaves, and spotted Stipulae. *Vicia sativa vulgaris semine nigro*. C.B. P. 344. Common cultivated Vetch, with a black Seed, frequently called Tares.

There are many more Species of this Genus than are here enumerated, some of which grow naturally in England, but as they are rarely cultivated, except in Botanical Gardens for Variety, they are omitted, as they are Plants of little Use or Beauty.

The 1st Sort here mentioned grows naturally among Bushes, and by the Sides of Woods in most Parts of England. The Root is perennial, but the Stalks are annual; these are weak, requiring Support; they rise 5 or 6 Feet high, fastening their Tendrils, which grow at the End of their Leaves, to the Bushes or Hedges, whereby they climb; they are hairy, as are also the Leaves, which are composed of about 10 Pair of Spear-shaped Lobes terminated by a Tendril. The Flowers stand on long Foot Stalks which spring from the Wings of the Stalk; the Spikes are long; the Flowers lie one over the other; they are of a fine blue Colour, so make a pretty Appearance, when they come out from between the Bushes or Shrubs which support them; they appear in July, and are succeeded by compressed Pods, filled with round Seeds which ripen in Autumn.

The 2d Sort grows naturally in the Woods near Bath or Bristol; this has a perennial Root. The Stalks are weak, and climb by the Help of their Tendrils over the neighbouring Bushes and Hedges, rising to the Height of 7 or 8 Feet. The Leaves are composed of 7 or 8 Pair of oval smooth Lobes terminated by Tendrils. The Flowers are produced in long Spikes from the Wings of the Stalks; they are of a pale blue Colour, and are larger than those of the former Sort; they appear in July, and are succeeded by short smooth Pods, filled with round Seeds which ripen in Autumn.

The 3d Sort grows naturally in Cassubia, this has a ligneous creeping Root; the Stalks trail on the Ground; they grow 3 Feet long, and their lower Parts become ligneous toward Autumn, but they die to the Root in Winter. The Leaves are composed of 10 Pair of oval acute-pointed Lobes. The Flowers come out from the Wings of the Stalk; they are disposed in short Spikes,

each containing, for the most Part, 6 pale blue Flowers which appear in July, and are succeeded by short smooth Pods like those of Lentils, including 3 or 4 round Seeds which ripen in Autumn.

These Sorts have been recommended to be sown in the Fields for Fodder for Cattle, but as their Stalks are slender and less succulent than those of the common Vetch, it is doubtful, if these will answer the Purpose of Farmers to cultivate them; for as their Stalks trail to a great Length, if they have not Support, they will be subject to rot by lying upon the Ground, and although their Roots are perennial, yet as it is late in the Spring before they shoot to a Height sufficient to cut for Use, there is little Want of green Feed for Cattle at that Time.

However a few of these Plants may be allowed a Place in large Gardens for Variety, where, if they are properly placed, they may be ornamental, particularly on the Borders of Wood Walks, or in Thickets of Shrubs. If some of the first Sort are allowed to climb up upon their Branches, they will have a good Effect during their Continuance in flower.

These Sorts are propagated by Seeds, which should be sown in Autumn, soon after they are ripe, for if they are kept out of the Ground till Spring, the Seeds often fail, or at least remain in the Ground a Year before they vegetate; they should be sown in the Places where the Plants are designed to remain, for they do not bear transplanting well. These Plants grow naturally in Woods and Thickets of Bushes, where their Roots are screened from the Sun, and their Stalks furnished with Supports by the Bushes, point out the Places where the Seeds should be sown, which should be where they are sheltered by Shrubs. If 3 or 4 Seeds are sown in each Patch, it will be sufficient, for if 1 or 2 Plants come up in each Place it will be enough. When the Plants come up they will require no other Culture but to keep them clean from Weeds, and their Stalks must be permitted to climb upon the neighbouring Shrubs, for if they trail on the Ground, they will produce few Flowers, and in wet Seasons the Stalks will rot, so the Plants will be rather unsightly.

The 4th Sort grows naturally in Siberia; this is a biennial Plant, which promises fairly to become a useful one for Fodder; for the Stalks of this grow to a great Length, and are well furnished with Leaves; These do not decay in Autumn, but continue green through the Winter in Defiance of the most severe Frost; so that in February and March, when there is often a Scarcity of green Feed for Ewes and Lambs, this may be of great Service.

The Stalks of this rise 5 or 6 Feet high. The Leaves are composed of 5 or 6 Pair of smooth Spear-shaped Lobes, terminated by Tendrils. The Foot Stalks are deeply furrowed. The Flowers are produced in Spikes upon long Foot Stalks, which spring from the Wings of the Stalks, they are of a light blue Colour, and appear in July; these are succeeded by short compressed Pods, containing 3 or 4 round Seeds which ripen in Autumn.

This Sort is propagated by Seeds, which may be sown in Spring or Autumn, and when the Plants come up, they will require no other Culture but to keep them clean.

clean from Weeds, and if they are supported from trailing on the Ground, they will continue in Verdure all the Winter, and the following Summer will flower and produce ripe Seeds.

If this Plant is designed for Feed, the Seeds should be sown in Rows at 4 Feet Distance, and should be dropped thin in the Rows, for as the Stalks send out many Branches, and extend to a great Length, so when the Plants are too close, the Branches will intermix, and mat so closely together as to rot each other by excluding the Air. When the Plants come up, they must be kept clean from Weeds, which, while they are young, should be performed with *Dutch Hoes*, but afterward it may be done by the Hoing Plough, which will save Expence, and with this Instrument the Plants may be earthed up in the same Manner as Peas and Beans, which will greatly strengthen their Stalks, and make them and the Leaves larger and more succulent, so increase the Quantity of Feed. If this is practised as often as may be found necessary to destroy the Weeds in Summer, it will prepare the Ground for any Crop which may afterward be put upon the Land, and as this will be in no Danger of suffering from Frost, so it should be preferred till the Spring, when there is a Want of green Feed for Ewes, at which Time it may be cut as it is wanted, but a Part of the Plants should be permitted to stand for Seeds, for those which are cut, if they do shoot again, will flower so late in Summer, that unless the Autumn proves very warm, the Seeds will not ripen, therefore it will be a better Way to sow a sufficient Quantity of Seeds for this Purpose in a separate Spot of Ground; because, when the other is cut, the Ground may be ploughed for other Crops, and if in mild Seasons there may be so great Plenty of other green Feed as not to want this, if the Plants are ploughed into the Ground, it will be a good Dressing for other Crops.

This is what I am now beginning to try in the Field, where I have not as yet had Experience of its Culture; but what I have here advised, is founded upon Experiments which I have for 6 Years made, on small Patches of it sown in Gardens, in different Situations. In all these Patches I have found the Plants continue in great Verdure, when most of the perennial Plants in the same Situation, have suffered greatly by the Frost, and from 8 of these Plants I could have cut as much Feed, as would have been equivalent to half a Truss of green Clover.

The 5th Sort is the common Vetch or Tare, which is much cultivated in the Fields for Fodder; of this there are two Varieties, if not distinct Species. The first, which is the most common, has a black Seed; the other has Seeds as white, if not whiter than the whitest Peas, and this Difference is permanent, for I have sown both Sorts many Years, and have never found either of them vary. These Plants are annual, and perish soon after they have perfected their Seeds. The Stalks are angular, streaked, and hairy; they are weak and want Support, so generally decline where they have nothing near to fasten themselves to. The Leaves are composed of several Pair of blunt Lobes, and are terminated by Tendrils. The Flowers come out from the Wings of the Stalk, sitting very close to the Base of the Foot Stalks of the Leaves; 2 of these generally spring from

the same Joint; they are pretty large and of the Butterfly Shape; those of the black-seeded Sort are purple, and those of the white-seeded are white; these appear in *June* and *July*, and are succeeded by erect Pods containing 3 or 4 round Seeds in each, which ripen in *August* and *September*.

The Sort with white Seeds is rather the more succulent Plant of the two, so is better for Fodder; but many People refuse to cultivate them, because they say the Seeds being white, are much sooner found out by the Rooks, than those which are nearer the Colour of the Ground, so are often devoured soon after they are sown, especially where any of the Seeds are not buried; but if the Seeds are sown in Drills, they may be so carefully covered, as that the Birds will not easily find them.

There is another Kind of Vetch which is cultivated in the Fields, with a smaller black Seed; this is called in some Countries *Rath ripe Vetch*, and in other *Pebble*, or *Summer Vetch*; but this being much tenderer than the common Vetch, is seldom cultivated, for this must always be sown in the Spring, and will ripen its Seeds the same Summer, but it will not afford near so good Fodder as the other.

Vetches are generally sown at two Seasons, one is in Autumn, and the other early in the Spring; but the best Time is in *August*, for the Seeds which are sown then will come up soon, and the Plants will have Time to get Strength before Winter, so will be in less Danger of suffering by Frost than those which are sown later, and will be fit to cut for Feed much earlier in the Spring, for it is then green Feed is most wanted; and if they are designed for Seed and not to be cut for Fodder, those early-sown Vetches will come early into flower, and the Seeds will be ripe early, so they may be cut and stacked in good Weather, which is a great Advantage, for those which ripen late are often stacked or housed wet, and then the Seeds frequently sprout in the Mow and are spoiled.

The usual Method of sowing Vetches is in Broadcast, ploughing them lightly in; in this Way the common Allowance of Seeds for one Acre of Land, is 2 Bushels; but there are some who sow 2 Bushels and a Half; this Practice may do well enough for those Vetches which are designed to be cut for Fodder in the Spring, but those which are sown with an Intent to stand for Seeds, will do much better if they are sown in Drills as is practised for Peas, and then less than half the Quantity of Seeds will be sufficient, for the Drills should not be nearer to each other than 3 Feet, that the Hoe Plough may have Room to go between them, to destroy the Weeds, and earth up the Plants, for by this Management they will produce a much greater Crop, and ripen earlier in the Season. These Drills should be about the same Depth as those usually made for Peas, and the Seeds should be scattered about the same Distance in the Drills. These Seeds should be carefully covered as soon as they are sown; for if they are left open, the Rooks will discover them; and when once they find the Rows, if they are not carefully watched, they will entirely devour them. Indeed these being sown early in Autumn, will be in less Danger than those which are sown late, or in the Spring, because there is more Food for Rooks and Pigeons in the open Fields at this Season, and the Plants

Plants will appear much sooner above Ground. The best Time to sow them is about the Beginning of August, for the Rains which usually fall about that Season, will bring them up in a short Time. Toward the latter End of October the Plants will have obtained considerable Strength, therefore they should be earthed up with the hoeing Plough. This Work should also be performed in dry Weather, and in doing it Care must be had to lay the Earth up as high to the Stems of the Plants as possible, so as not to cover their Tops, because this will secure them against Frost. The whole Space of Ground between the Rows should also be stirred, in order to destroy the Weeds; which, if carefully performed in dry Weather, will lay the Land clean till March; at which Time the Crop should be earthed a second Time, and the Ground cleaned again between the Rows, which will cause the Plants to grow vigorous, and in a little Time they will spread so as to meet, and cover the Spaces; whereas those sown in the Spring will not grow to half this Size, and will be very late in flowering.

Some People sow these Vetches, and when they are fully grown, plough them into the Ground to manure it. Where this is designed, there will be no occasion to sow them in Drills at this Distance, not to husband them in the Manner before directed; but in this Case it will be the best Method to sow them in Autumn, because they will be fit to plough in, much sooner the following Year; so that the Land may be better prepared to receive the Crops for which it is intended. In some Parts of France, and in Italy, these Vetches are sown for feeding Cattle while green, and are accounted very profitable, and in many Parts of England they are cultivated to feed Cart Horses, &c. though upon such Land where Lucern will thrive, it will be much better Husbandry to cultivate that for this Purpose.

Where these Plants are cultivated for their Seeds, they should be cut soon after the Pods change brown; and when they are dry they must be immediately stacked, for if they are suffered to lie out in the Field to receive Wet, and there comes one hot Day after it, the Pods will most of them burst, and cast out the Seeds. When the Seeds are threshed out, the Haulm is esteemed very good Food for Cattle, and some have recommended the Seeds for Horses, and affirm they are as proper for those Animals as Beans; which, if true will render them more valuable, because these will grow on the lightest sandy Land, where Beans will not thrive, so may be a good Improvement to some Counties in England, where they do not attempt to cultivate Beans.

VINCA. Lin. Gen. Pl. 261 *Pervinca*. Tourn. Inst. R. H. 119. Tab. 45. Periwinkle; in French, *Pervenche*.

The Characters are,

The Empalement of the Flower is permanent, and cut into 5 acute Parts at the Top. The Flower has 1 Salver-shaped Petal, whose Tube is longer than the Empalement. The Brim is broad, spreading open, and slightly cut into 5 obtuse Segments; it has 5 very short inflexed Stamina, terminated by erect, obtuse, membranaceous Summits, and 2 roundish Germina which have 2 roundish Corpuscles on their Side, supporting 1 common Style the Length of the Stamina, crowned by 2 Stigmas; the under is orbicular and plain, the upper is concave and beaded. The Germina

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turn to a Fruit composed of 2 taper acute-pointed Husks opening Lengthways with 1 Valve and filled with oblong cylindrical Seeds.

The Species are,

1. VINCA *caulibus procumbentibus, foliis lanceolato-ovatis*. Lin. Sp. Pl. 209. Periwinkle with trailing Stalks, and oval Spear-shaped Leaves. *Pervinca vulgaris, angustifolia, flore caeruleo*. Tourn. Inst. 120. Common narrow-leaved Periwinkle, with a blue Flower.

2. VINCA *caulibus erectis, foliis ovatis*. Lin. Sp. Pl. 209. Periwinkle with erect Stalks, and oval Leaves. *Pervinca vulgaris, latifolia, flore caeruleo*. Tourn. Inst. 119. Common broad-leaved Periwinkle with a blue Flower.

3. VINCA *foliis oblongo-ovatis integerrimis, tubo floris longissimo, caule ramoso fruticoso*. Tab. 186. Periwinkle with oblong, oval, entire Leaves, a very long Tube to the Flower, and a shrubby branching Stalk.

The 1st grows naturally under Hedges and Bushes in many Parts of England. The Stalks are slender, and trail on the Ground, emitting Fibres from their Joints, which take Root in the Ground, whereby the Plant multiplies and spreads greatly. The Leaves are placed opposite on their Stalks; they are oval, Spear-shaped, about an Inch and a Half long, and three Quarters of an Inch broad, of a thick Consistence, very smooth, and entire; their upper Side is of a deep lucid green, and their under Side of a bright green Colour; they stand on short Foot Stalks. The Flowers stand singly on Foot Stalks, which spring from the Wings of the Stalks, they are nearly of a Funnel Shape, but spread more at their Brim, which is almost flat like a Salver; their Brim is divided into 5 broad obtuse Segments. The most common Colour of the Flower is blue; but it is often found with a white Flower, and sometimes the Flowers are variegated with both Colours. These Flowers begin to appear in April, and there is often a Succession of them continued great Part of Summer. These Flowers are very rarely succeeded by Seeds. Tournefort says he was at a Loss for the Fruit of this Plant, to engrave the Figure of it in his *Elements of Botany*, which he obtained by planting some Plants in small Pots to confine their Roots, and prevent their Stalks from trailing on the Ground. This Experiment I tried several Years without Success; but I afterward planted 3 or 4 Plants in the full Ground, and constantly cut off their lateral Shoots, leaving only the upper Stalks; and these Plants the second Year produced Plenty of the Pods.

There are 2 Varieties of this Plant with variegated Leaves; one has white, and the other yellow Stripes; these are by some preserved in their Gardens for Variety. There is also one with double purple Flowers, which I believe to be only an accidental Variation, therefore have not enumerated it here.

The 2d Sort is also found growing naturally in several Parts of England. The Stalks of this are larger than those of the former, and do not trail so close to the Ground; they rise 2 Feet high, but their Tops decline again to the Ground; and often put out Roots when they are suffered to lie on the Ground. The Leaves of this Sort are oval, Heart-shaped, about 3 Inches long, and 2 broad; they stand opposite on thick Foot Stalks; their upper Surface is of a lucid green, 4 F their

their under is of a lighter green Colour; they are of a thick Consistence and entire. The Flowers come out from the Wings of the Stalk in like Manner as the former, and are of the same Shape but much larger. Their usual Colour is blue, but they are sometimes seen with white Flowers. This Sort flowers earlier in the Spring than the former, and there is a Succession of them great Part of Summer.

As these Plants delight to grow under the Cover of Trees and Bushes, they may be made ornamental in large Gardens, if planted on the Verges of Wildernesses, where they will spread, and cover the Ground, and as their Leaves continue green all the Year, they will have a good Effect in Winter, and their Flowers appearing great Part of Summer, will add to the Variety.

They are easily propagated by their trailing Stalks, which put out Roots very freely, especially those of the first Sort; and if the Stalks of the large Sort are laid in the Ground, they will root very soon, and may be cut off and transplanted where they are to remain, where, when they are once rooted, they will spread and multiply very fast without farther Care. The first Sort is used in Medicine, and is esteemed a good vulnerary Plant.

The 3d Sort grows naturally in the Island of *Madagascar*, from whence the Seeds were brought to the Royal Garden at *Paris*, where the Plants were first raised and produced their Flowers the following Summer; from these Plants good Seeds were obtained, Part of which was sent me by Mr. *Richard*, Gardener to the King at *Verfailles* and *Tranon*. These succeeded in the *Chelsea* Garden, where many Plants were raised. It rises with an upright branching Stalk to the Height of 3 or 4 Feet, which when young are succulent, jointed, and of a purple Colour; but as the Plants advance, their lower Parts become ligneous. The Branches which come out from the Side, have their Joints very close; they have a smooth purple Bark, and are garnished with oblong, oval, entire Leaves, 2 Inches and a Half long, and 1 and a Half broad; they are smooth and succulent, sitting pretty close to the Branches. The Flowers come out from the Wings of the Branches singly, standing on very short Foot Stalks; their Tube is long and slender; their Brim spreads open flat, which is divided into 5 broad obtuse Segments, reflexed at their Points. The upper Surface of the Petal is of a bright crimson or Peach Colour, and their under Side is of a pale Flesh Colour. There is a succession of these Flowers upon the same Plant, from February to the End of *October*. Those Flowers which appear early in the Summer, are succeeded by taper Seed Vessels, filled with roundish black Seeds, which ripen in Autumn.

This Sort is propagated by Seeds or Cuttings; those Plants which arise from Seeds grow more upright, and do not branch so much as the Plants propagated by Cuttings. The Seeds of this should be sown on a moderate hot Bed, in the Spring, and when the Plants come up, and are fit to remove, they should be transplanted on a fresh hot Bed at about 4 Inches Distance, shading them from the Sun till they have taken new Root; then they must be treated as other young tender Plants which are Natives of warm Countries, but their must

be great Care had to prevent their drawing up weak nor should they have Water in too great Plenty. When the Plants have obtained Strength, they should be carefully taken up with Balls of Earth to their Roots, and planted in Pots filled with good Earth, and plunged into a moderate hot Bed to facilitate their taking new Root, observing to screen them from the Sun, and when they are well rooted in the Pots, they must be gradually hardened to bear the open Air; but unless the Summer proves warm, these Plants should not be placed in the open Air, for they will not thrive if they are exposed to Cold or Wet; therefore during the Summer they should be placed in an airy Glass Case; and in Winter they must be removed into the Stove, where the Air is kept to a temperate Heat, without which they will not live through the Winter in England.

If these Plants are propagated by Cuttings, they should be planted in Pots during any of the Summer Months. The Pots should be plunged into a moderate hot Bed, and if they are closely covered with Bell or Hand Glasses, it will cause them to put out Roots sooner than they otherwise would do; when these have put out Roots, they must be gradually hardened, and afterward planted in Pots, and treated as the seedling Plants.

This Plant deserves a Place in the Stove, as much as any of the exotick Plants we have in England, because the Flowers are very beautiful, and there is a constant Succession of them all the Summer.

VINCITOXICUM. See *Asclepias*.

VINE. See *Vitis*.

VIOLA. *Tourn. Inst. R. H. 419. Tab. 236. Lin. Gen. Pl. 898. Violet.*

The Characters are,

The Flower has a short permanent Empalement of 5 Leaves, which are differently ranged in the different Species. The Flower is of the ringent Kind, and is composed of 5 unequal Petals; the upper is broad, obtuse, and indented at the Point, having a burred Nectarium at the Base; two Side Petals are opposite; the 2 lower are larger, rising and reflexed; it has 5 small Stamina, annexed as Appendages to the Entrance of the Nectarium, terminated by obtuse Summits, which are sometimes connected, and a roundish Germen supporting a slender Style which stands out beyond the Summits, crowned by an oblique Stigma. The Germen afterward turns to an oval three-cornered Capsule with 1 Cell, opening with 3 Valves, including many oval Seeds.

The Species are,

1. *VIOLA acaulis, foliis cordatis, stolonibus reptantibus. Lin. Sp. Pl. 934.* Violet having Stalks, Heart-shaped Leaves, and creeping Shoots. *Viola martia purpurea, flore simplici odoro. C. B. P. 199.* Purple March Violet with a single sweet Flower.

2. *VIOLA acaulis, foliis cordatis piloso-hispidis. Flor. Suec. 718.* Violet without Stalk, and having Heart-shaped Leaves with stinging Hairs. *Viola martia hirsuta inodora. Mor. Hist. 2. p. 475.* Hairy scentless March Violet.

3. *VIOLA acaulis, foliis reniformibus. Haller. Helvet. 501.* Violet without Stalk, and having Kidney-shaped Leaves. *Viola palustris rotundifolia, glabra. Mor. Hist. 1. p. 475.* March Violet with round smooth Leaves.

4. *VIOLA acaulis, foliis lanceolatis crenatis.* Lin. Sp. Plant. 934. Violet without Stalks, and having Spear-shaped notched Leaves. *Viola Acadensis, folio longo sinuato.* Diervil. Acadian Violet with a long sinuated Leaf.

5. *VIOLA acaulis, foliis pedatis septempartitis.* Lin. Sp. Pl. 933. Violet without Stalks, and Leaves growing like Feet, divided into 7 Parts. *Viola Virginiana tricolor, foliis multifidis, cauliculis aphyllis.* Pluk. Alm. 388. Three-coloured Virginia Violet, with many-pointed Leaves, and a naked Stalk.

6. *VIOLA acaulis, foliis palmatis quinque lobis dentatis indivisisque.* Lin. Sp. Pl. 933. Violet without Stalks, and having Hand-shaped Leaves, with 5 indented undivided Lobes. *Viola Virginiana, platani ferè foliis parvis & incanis.* Pluk. Mantif. 187. Virginia Violet with small hoary Leaves, like those of the Plane Tree.

7. *VIOLA acaulis, foliis pinnatifidis.* Lin. Sp. Pl. 734. Violet without Stalks, and Leaves having many Points. *Viola Alpina, folio in plures partes dissecto.* C. B. P. 199. Alpine Violet with a Leaf cut into many Parts.

8. *VIOLA acaulis, grandiflora, foliis ovalibus uniformibus integerrimis.* Allion. Violet without a Stalk, but having a large Flower, and oval entire Leaves which are uniform.

9. *VIOLA caulibus erectis, foliis cordatis oblongis.* Lin. Sp. Pl. 935. Violet with erect Stalks, and oblong Heart-shaped Leaves. *Viola martia arborescens purpurea.* C. B. P. 199. Tree-like, purple, March Violet.

10. *VIOLA caule triquetro diffuso, foliis oblongis dentatis, stipulis multifidis.* Violet with a four-cornered, diffused Stalk, oblong indented Leaves, and many-pointed Stipulæ. *Viola tricolor bortenensis repens.* C. B. P. 199. Creeping three-coloured Garden Violet, commonly called Hearts ease or Pansies.

11. *VIOLA caule diffuso decumbente, foliis oblongis incisis, stolonibus reptatricibus.* Violet with a diffused trailing Stalk, oblong cut Leaves and creeping Shoots. *Viola montana, lutea grandiflora.* C. B. P. 200. Yellow Mountain Violet with a large Flower.

The 1st Sort, which is the common sweet Violet, grows naturally under Hedges in the Neighbourhood of London; but in several of the distant Counties, the Violet without Scent is the Sort most frequent. Of the common Violet there are the following Varieties. The single blue and white; the double blue and white; and the pale purple. These are all of them commonly preserved in Gardens, for the Odour of their Flowers; this has a thick fibrous Root, sending forth long trailing Shoots, which put out Fibres and take Root in the Ground, whereby it spreads and propagates. The Leaves grow on pretty long Foot Stalks; they are Heart-shaped, and somewhat hairy. The Flowers stand on slender naked Foot Stalks which arise immediately from the Heads of the Plants; they are of an irregular Figure; in some resembling the Snout of an Animal, composed of 5 unequal Petals, one of which has a Heel, or horned Nectarium at the Base. These Flowers generally appear in March, from whence they had the Appellation of March Violets. After the Flowers are past, the Germen swells to a roundish Capsule with 3 Furrows, having 1 Cell, in which are lodged 4 or 5 round Seeds which ripen in July.

The Flowers of this Sort are one of the 4 cordial Flowers; they are esteemed cooling, moistening, and laxative. The Leaves of the Plants are sometimes used in Clysters; but the Flowers of the second Sort have been frequently brought to the Markets, and sold for this, which have no Scent, so are unfit for the Purposes intended, but being larger they fill the Measure sooner.

The 2d Sort is found growing naturally in many Parts of England. The Leaves of this Sort are larger and are covered with rough stinging Hairs. The Flowers are larger and have no Scent, which are the only Differences.

The 3d Sort grows naturally in Marshes and on Bogs in several Parts of England. The Leaves of this are small, Kidney-shaped, and smooth. The Flowers are small, and of a pale blue Colour; they appear in June, and are succeeded by small oblong Capsules filled with roundish Seed.

The 4th Sort grows naturally in North America, from whence it has been brought to Europe; where it is preserved in some curious Gardens. The Leaves of this are Spear-shaped, and deeply notched on their Edges, standing on short Foot Stalks. The Flowers are larger than those of the common Sort, but have no Scent.

The 5th Sort is also a Native of North America. The Leaves of this are divided into 7 Parts or Lobes, which are united at the Foot Stalk. The Flowers stand on naked Foot Stalks, they are of the Pansy Kind, and have no Scent; they appear in June, but are not succeeded by Seeds here.

The 6th Sort grows naturally in Virginia. The Leaves of this are most of them divided into 5 Lobes like the Fingers of a Hand, but some of the lower Leaves are entire. The Flowers are small, white, and have no Scent. This flowers at the same Time with the former.

The 7th Sort grows naturally on the Alps; this was sent me by Dr. Allione from Turin; it is a very low Plant, seldom rising 2 Inches high. The Leaves are small, and cut into winged Points. The Flowers are of a pale blue Colour, and appear in June.

The 8th Sort was sent me by the same Gentleman, who found it growing on the Alps; this is also an humble Plant, with oval, entire, uniform Leaves, not more than half an Inch long, and a Quarter broad, standing on short Foot Stalks. The Flowers are large, of a light blue Colour, and appear in June. These have no Scent.

The 9th Sort grows naturally on the Alps, and the Mountains in Austria. The Root of this is perennial, but the Stalks and Leaves decay in Autumn; this has erect Stalks which rise more than a Foot high; they are garnished with oblong, Heart-shaped Leaves. The Flowers stand on long Foot Stalks, which spring from the Wings of the Stalks; they are shaped like those of the Dog Violet, and are of a pale blue Colour, these appear the End of May, and are succeeded by roundish Capsules filled with small Seeds, which ripen in August.

The 10th Sort is the Hearts-ease or Pansies, which grows naturally in some of the northern Counties of England, but is generally cultivated in Gardens. Of this there are many Varieties, which differ greatly in the Size and Colour of their Flowers. Some of these

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Varieties have very large beautiful Flowers, which have an agreeable Odour; others have small Flowers without Scent; whether these are distinct Species or accidental Varieties, I have not been able to determine, for I have sowed the Seeds of most of the Varieties as carefully as possible, and have sown them separate, but have always had a Mixture arise, which may have come from Seeds lying in the Ground; for in Gardens, where these Plants have been permitted to scatter their Seeds, it is impossible to know how long the Seeds may lie in the Ground, and when they are turned up to the Surface, they will grow, which renders it difficult to determine the specifick Differences of these Plants in such Places.

This is an annual Plant, whose Roots decay after they have flowered and perfected their Seeds. The lower Leaves are roundish or oblong, and are indented on their Edges; the Stalks rise 7 or 8 Inches high, sending out many diffused Branches; they are four-cornered, and are garnished with Leaves which are longer and narrower than those below; these are notched on their Edges, and sit close to the Branches. The Flowers stand on long naked Foot Stalks, which spring from the Wings of the Stalk; they are in Shape like those of the common Violet. Some of the Varieties have Flowers much larger, and others are of the Size of *March* Violets; some of them have the 2 upper Petals of a deep yellow Colour with a purple Spot in each, the two middle of a paler yellow with a deep yellow Spot, and the lower Petal of a Velvet Colour; in others the Petals are white with yellow and purple Spots; in some the yellow is the most prevailing Colour, and in others the purple.

The 11th Sort grows naturally on Mountains in the North of *England*, and in *Wales*; this has a perennial Root, sending out Shoots from the Side, which spread and propagate, in which it differs from all the Pansies. The lower Leaves are oblong and jagged; the Stalks seldom rise more than 4 or 5 Inches high; they decline at the Bottom, and are garnished with narrower Leaves than those below, which are deeper cut on their Sides. The Flowers stand on naked Foot Stalks 2 Inches long; they are much larger than those of the common Sort, and are of a deep yellow Colour, with a few purple Streaks in the Center. This Plant continues flowering great Part of Summer, but the Flowers have no Scent.

The common Violets are easily propagated by parting their Roots; this may be done at two Seasons: The first or most common Season is at *Michaelmas*, that the young Plants may be well rooted before Winter; this is generally practised where the Plants are put on the Borders of Wood Walks in large Plantations, but in the Gardens where they are cultivated for their Flowers, the Gardeners transplant and part their Plants, soon after their flowering Season is over, so they gather all the Flowers first, and the Plants, which are then removed, will have all the remaining Summer to grow and get Strength, so will produce a greater Quantity of Flowers the following Spring, than those which are removed in Autumn, but this is not to be practised where they cannot be supplied with Water till they have taken new Root, unless in moist Seasons.

When these are planted, they should be placed at

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a good Distance from each other to allow them Room to spread, for if they are expected to produce many Flowers, they should not be transplanted oftener than once in 3 or 4 Years, so that in that Time the Offsets will spread over the Ground, if the Roots are 3 Feet asunder.

Violets may also be propagated by Seeds, which should be sown soon after they are ripe, which is about the End of *August*. The Plants will come up the following Spring, and when they are fit to remove, they should be transplanted in shady Borders to grow till Autumn, and then they may be planted where they are to remain, but the double-flowering Violets do not produce Seeds. Although the white, blue, and purple Violets are generally supposed to be Varieties which have accidentally sprung from Seeds, yet I have several Years sowed the Seeds of all the 3 Sorts, and have not found either of them vary.

The other Sorts of Spring Violets are sometimes preserved in Botanick Gardens for Variety; these may be propagated as the common Sort, but require a moist Soil and a shady Situation.

The upright Sort does not send out Shoots like the common Violet, so increases but slowly by Offsets; this may be propagated by Seeds in Plenty, and is as hardy as the common Sort.

The several Varieties of Pansies will scatter their Seeds in a short Time after the Flowers are past, and from these self-sown Seeds the Plants, which come up in Autumn, will flower very early in the Spring, and these will be succeeded by the Spring Plants, so that where they are indulged in a Garden, and their Seeds permitted to scatter, there will be a constant Succession of their Flowers the greatest Part of the Year, for they will flower all the Winter in mild Seasons, and most Part of the Summer in shady Situations, which renders them worthy of a Place in every good Garden, but then they must not be allowed to spread too far, lest they become troublesome Weeds, for their Seeds, when ripe, are cast out of their Covers with great Elasticity to a considerable Distance, and the Plants will soon spread over a large Space of Ground, if they are permitted to stand.

The common Pansy stands in the *College Dispensatory* as a medicinal Plant, but is rarely used in *England*.

The great yellow Violet propagates by Offsets in pretty great Plenty, if it has a moist Soil and a shady Situation; this may be transplanted in Autumn, and the Offsets may then be taken off, but the Roots should not be divided into small Heads, nor should they be too often transplanted, because they will not produce many Flowers unless the Plants are strong, and have good Root in the Ground. This Sort will not live in a dry Soil, nor in a Situation much exposed to the Sun.

VIORNA. See *Clematis*.

VIRGA AUREA. See *Solidago*.

VISCUM. *Tourn. Inst. R. H.* 609. *Tab.* 380. *Lin. Gen. Pl.* 979. *Mistletoe*; in *French*, *Gui*.

The Characters are,

It has male and female Flowers upon separate Plants. The male Flowers have an Empelement composed of 4 oblong Leaves; they have no Petals, but have 4 Summits, which are oblong and acute-pointed, each fastened

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to 1 of the Leaves of the Empalement. The female Flowers have an Empalement of 4 small oval Leaves sitting upon the Germen; these have no Petals or Stamina, but have an oblong three-cornered Germen situated under the Flower, having no Style, but crowned by an obtuse Stigma. The Germen turns to a globular smooth Berry with 1 Cell, including a fleshy Heart shaped Seed.

We have but one Species of this Genus in Europe, viz.

VISCUM foliis lanceolatis obtusis, caule dichotomo, spicis axillaribus. Lin. Sp. Pl. 1023. Mistleto with blunt Spear-shaped Leaves, Stalks dividing by Pairs, and Spikes of Flowers rising from the Wings of the Stalk. *Viscum baccis albis.* C. B. P. 423. Mistleto with white Berries.

This Plant, instead of rooting and growing in the Earth like other Plants, fixes itself, and takes Root on the Branches of Trees; it spreads out with many Branches, and forms a large Bush. The Branches are ligreous; they have a yellow green Bark; the largest is about the Thickness of a Man's Finger; the other are gradually smaller; they are full of Joints which easily part asunder, at each of which grow 2 thick fleshy Leaves, which are broad and rounded at their Points, and narrow at their Base. The Flowers come out from the Wings of the Stalk in short Spikes; they have 4 yellow Leaves, which are by some called Petals, and others make them the Empalement. The female Flowers are succeeded by round white Berries, which are almost pellucid, about the Size of large white Currants, full of a tough viscid Juice, in the Middle of which lies one Heart-shaped flat Seed.

It grows upon the white Thorn, the Apple, the Crab, the Hazel, the Ash, and Maple, but is rarely found upon the Oak, though the Mistleto of the last has been always accounted the best of all, which Opinion, as Mr. Ray well observes, may be owing to the superstitious Honour the ancient *Druids* of this Island gave to this Mistleto, to whom nothing was more sacred.

This Plant is always produced from Seed, and is not to be cultivated in the Earth, as most other Plants, but will always grow upon Trees, from whence the Ancients accounted it a Super-plant, most of whom thought it was an Excrecence on the Tree, without the Seed being previously lodged there, which Opinion is now generally confuted from a repeated Number of Experiments.

The Manner of its being propagated is this, viz. The Mistleto Thrush, which feeds upon the Berries of this Plant, in Winter, when it is ripe, doth often carry the Seeds from Tree to Tree; for the viscid Part of the Berry, which immediately surrounds the Seed, doth sometimes fasten it to the outward Part of the Bird's Beak, which, to get disengaged of, he strikes his Beak against the Branches of a neighbouring Tree, and thereby leaves the Seed sticking by this viscid Matter to the Bark, which, if it lights upon a smooth Part of the Tree, will fasten itself thereto and the following Winter will put out and grow, and in the same Manner it may be propagated by Art, for if the Berries, when full ripe, are rubbed upon the smooth Part of the Bark of a Tree, they will adhere closely thereto, and, if not destroyed, will produce Plants the following Winter.

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The Trees, which this Plant doth most readily take upon, are the Apple, the Ash, and other smooth-rinded Trees before mentioned, but I have several Times tried it upon the Oak without Success, for the Bark of that Tree is of too close a Texture to admit the Seeds sticking therein, which is also the Reason it is so rarely found upon that Tree, and notwithstanding the great Encomiums which have been given to the Mistleto of the Oak for its medicinal Virtues, yet I cannot help thinking that it is equally good from whatever Tree it be taken, nor is it possible to find this Plant growing in any Quantity upon the Oak, so that those Persons, who pretend to furnish the Town with it for physical Use, do but impose upon the World, for it is so rarely met with, that whenever a Branch of an Oak Tree hath any of these Plants growing upon it, it is cut off, and preserved by the Curious in their Collections of natural Curiosities, and of these there are but few to be seen in *England*.

As to what some Persons have asserted of the Manner how it is propagated, from Tree to Tree, by the Mistleto Thrushes, which eat the Berries, and void the Seed in their Dung upon the Branches of Trees, whereby the Seeds are stuck thereon, and take Root into the Bark, and produce fresh Plants, I can by no means agree to; since, if it were only this Way propagated, it would always be found on the upper Part or the Sides of such Branches, upon which the Dung can only be supposed to lodge, whereas it is generally found upon the under Side of Branches, where it is almost impossible for these Birds to cast their Dung; besides, I believe the Stomachs of these Birds are too powerful Digesters to suffer any Seeds to pass so entire through the Intestines as to afterwards grow, but I shall leave this to such as have Leisure to make Observations in those Places where this Plant abounds, and shall add only a short Account of the Method used to make Birdlime, which may not be improper to insert in this Place for the Satisfaction of the Curious.

The *Italians* make their Birdlime of the Berries of Mistleto heated and mixed with Oil, as is that made of Holly Bark, and to make it bear the Water, they add Turpentine.

Of the Berries of this Plant Birdlime was formerly made in *England*. This was done by boiling the Berries in Water till the burst, when they were well beaten in a Mortar, and afterward washed till all the branny Husks were cleared away.

That which is now commonly used with us is made of the Bark of Holly, which is stripped off about *Midsummer*; this they boil for ten or twelve Hours, and when the green Coat is separated from the other, they cover it up with Fern for a Fortnight, and put it in a moist Place, where it lies a Fortnight, by which Time the Bark will be turned to a Jelly, and no Fibres of the Wood be left; then they beat it in a Stone Mortar till it becomes a tough Paste, this they wash in a running Stream till no Motes appear, and put it up to ferment for four or five Days, and scum it as often as any Thing arises, and then lay it up for Use. When they use it, they incorporate with it a third Part of that Oil over the Fire.

The Birdlime that is brought from *Damascus* is supposed to be made of *Sebestens*, their *Kernels* being frequently

frequently found in it, but this will not endure either Frost or Wet.

The Birdlime brought from Spain is of an ill smell.

The Bark of our Wayfaring Shrub, it is said, will make Birdlime as good as the best.

VISNAGA. See Daucus.

VITEX. Tourn. Inst. R. H. 603. Tab. 373. Lin. Gen. Pl. 708. *Agnus Castus*, or the Chaste Tree.

The Characters are,

The Empalement of the Flower is short, cylindrical, and indented in 5 Parts. The Flower has 1 ringent Petal with a slender cylindrical Tube; the Brim is plain, and divided into 2 Lips; the 2 Lips are trifid; the middle Segment is the broadest in both. It has 4 Hair-like Stamina which are a little longer than the Tube, 2 being shorter than the other, terminated by moveable Summits, and a roundish Germen, supporting a slender Style, crowned by 2 Awl-shaped spreading Stigmas. The Germen afterward turns to a globular Berry with 4 Cells, each containing 1 oval Seed.

The Species are,

1. VITEX foliis digitatis, spicis verticillatis. Lin. Sp. Pl. 938. Chaste Tree with fingered Leaves, and whorled Spikes of Flowers. *Vitex foliis angustioribus cannabibus modo dispositis*. C. B. P. 475. Chaste Tree with narrow Leaves disposed like those of Hemp, or common Chaste Tree.

2. VITEX foliis digitatis serratis, spicis paniculatis. Chaste Tree with fingered sawed Leaves, and Spikes in Panicles. *Vitex folio latiore serrato*. Lob. Icon. 139. Chaste Tree with a broader sawed Leaf.

3. VITEX foliis ternatis quinatisque, paniculis dichotomis. Lin. Sp. Plant. 938. Chaste Tree with trifoliate and quinate Leaves, and Panicles of Flowers rising from the Division of the Branches. *Vitex trifolia minor Indica*. Pluk. Alm. 390. Smaller Indian trifoliate Chaste Tree.

4. VITEX foliis quinatis ternatisque serratis, spicis alaribus terminalibusque. Chaste Tree with quinate and trifoliate sawed Leaves, and Spikes of Flowers from the Wings terminating the Branches.

5. VITEX foliis ternatis quinatisque pinnato incisis, spicis verticillatis terminalibus. Chaste Tree with ternate and quinate Leaves cut like Wings, and whorled Spikes of Flowers terminating the Branches.

The 1st Sort grows naturally in Sicily, and near Naples by the Sides of Rivers and in moist Places; it has a shrubby Stalk, 8 or 10 Feet high, sending out Branches opposite the whole Length, which are angular, pliable, and have a grayish Bark; these are garnished with Leaves for the most part placed opposite upon pretty long Foot Stalks; they are composed of 5, 6, or 7 Lobes which unite at the Foot Stalk, and spread out like the Fingers of a Hand; the lower are small, and the middle are largest; they are smooth and entire; the largest are about 3 Inches long, and half an Inch broad in the Middle, ending in blunt Points, of a dark green on their upper Side, but hoary on their under. The Flowers are produced in Spikes at the Extremity of the Branches; the Spikes are from 7 to 15 Inches long; the Flowers are disposed in Whorls round the Stalks, with Intervals between each Whorl; they are of the Lip Kind; the 2 Lips are each cut into 3 Segments, the middle being larger than the 2 Side Segments; they are in some Plants white, and in others blue; these are ge-

nerally late before they appear, so that in bad Seasons they do not open fair, and in warm Years the Plants produce no Seeds here. The Flowers have an agreeable Odour when they open fair, and make a good Appearance in Autumn, when the Flowers of most other Shrubs are gone, for in warm mild Seasons I have seen these Shrubs in full flower the middle of October.

The 2d Sort grows naturally in the South of France, and in Italy; this is a lower Shrub than the first; it seldom rises more than 4 or 5 Feet high, coming up with several Stalks from the Root, which do not branch to much as the former; their Bark is also whiter. The Leaves are fingered, and composed of 5 or 7 Lobes which unite at the Foot Stalk, these are not so disproportionate in their Length, the longest being seldom more than 2 Inches, and the shortest an Inch and a Half; they are near an Inch broad, and are sawed on their Edges, and are not so stiff as those of the former. The Flowers come out in panicked Spikes toward the End of the Branches; the Spikes are shorter, and the Flowers smaller than those of the first Sort, and appear sooner; they are all of them blue which I have seen.

The 3d Sort grows naturally in both Indies; this has a shrubby Stalk, which rises 9 or 10 Feet high, sending out many Side Branches which have a brown Bark, and are garnished with Leaves which have sometimes 3, and at others 5, oval acute-pointed Lobes which are entire, and a little downy on their under Side. The Flowers are disposed in Panicles which arise at the Division of the Branches; these are small, and white, but are not succeeded by any Seeds in England.

The 4th Sort grows naturally in the northern Parts of China, where it rises with woody Stalks, 8 or 10 Feet high, having a gray Bark. The Branches come out opposite, and are garnished with Leaves placed opposite, upon long Foot Stalks; these are composed of 3 or 5 Spear-shaped Lobes which are deeply sawed on their Edges, and end in very acute Points; the largest of these Lobes are 3 Inches and a Half long, and an Inch and a Quarter broad, of a dark green on their upper Side, but gray on their under. The Flowers are disposed in whorled Spikes, which come out opposite from the Wings of the Stalk, and the Branches are terminated by branching Spikes of Flowers; these are blue, and about the Size of those of the first. This flowers in July and August, but does not produce Seeds in England.

The 5th Sort is a Native of China; this is a lower Shrub than either of the former. The Stalk seldom rises more than 3 Feet high, sending out spreading Branches on every Side, which are slender and angular; these are garnished with Leaves placed opposite, which stand on pretty long Foot Stalks; they are some of them composed of 3, and others of 5 Lobes, which are deeply and regularly cut on their Sides in Form of winged Leaves, and end in acute Points. The largest of these Lobes is about an Inch and a Half long, and three Quarters of an Inch broad in the Middle; they are of a dull green Colour on their upper Side, and gray on their under. The Branches are terminated by Spikes of Flowers about 3 or 4 Inches long, which are disposed in Whorls round the Stalks; these are in some Plants white, in others blue, and some have bright red

red Flowers; they are in Beauty from the Middle of July to the Beginning of September, but the Plants do not produce Seeds in Europe.

The 1st Sort is pretty common in many English Gardens, where it has been long an Inhabitant, but was not much propagated till of late Years. The second Sort is less common, and only in some curious Gardens at present. These Plants are very hardy, and may be propagated by planting their Cuttings early in the Spring, before they shoot; they require a fresh light Soil, and must be frequently refreshed with Water, until they have taken Root; after which they must be carefully cleared from Weeds, during the Summer Season, and if the following Winter prove severe, you must lay a little Mulch on the Surface of the Ground between the Plants to prevent the Frost from penetrating to their Roots, which would injure them while they are young; and as these Cuttings are apt to shoot late in the Year, their Tops will be very tender, and the early Frosts in Autumn often kill them down a considerable Length, if they are not protected, therefore they should then be covered with Mats, which will be of great Service to them. Toward the Middle of March, if the Season is favourable, you should transplant them either into the Places where they are designed to remain, or into a Nursery to grow 2 or 3 Years to get Strength, where they must be pruned up in order to form them into regular Stalks, otherwise they are very subject to shoot out their Branches in a straggling Manner.

They may also be propagated by laying down their Branches in the Spring of the Year, in doing which you must be very careful not to break them, for their Shoots are apt to split, if they are violently forced; these will take Root in one Year, provided they are watered in very dry Weather, and may then be transplanted out, and managed, as directed for those Plants raised from Cuttings.

The 3d Sort is too tender to live in the open Air in England, so must be planted in Pots, and constantly kept in the Stove; it is propagated both by Cuttings and Layers, but the Cuttings of this must be planted in Pots, and plunged into a moderate hot Bed, covering them close with a Bell or Hand Glass, to exclude the Air; they should be refreshed with Water now and then, but it must not be given them too freely. The best Time to plant the Cuttings is about the Middle or latter End of April, for if they succeed, they will put out Roots in 6 or 7 Weeks, and will then begin to shoot, so they should have the free Air gradually admitted to them to prevent their shooting weak; then they may be carefully taken up, and each planted in a separate small Pot filled with light Earth, and plunged into the hot Bed again, shading them from the Sun till they have taken new Root, after which they should have Plenty of free Air at all Times when the Weather is good, treating them in the same Manner as other tender Plants. In Winter they must be kept in a moderate Temperature of Heat, but in the Summer they should have the free Air in mild Weather, but not removed into the open Air.

As this Plant retains its Leaves all the Year, it makes a Variety in the Stove, but the Flowers have no great Beauty.

The 4th Sort is I believe lost in the English Gardens, for it had lived in the open Air, some Years, which had encouraged People to plant them in the full Ground, where they were all destroyed by the severe Frost in 1740, since when I have not seen one of the growing Plants.

This Sort casts its Leaves in Autumn like the two first, and it is late in the Spring before the new Leaves come out; it was propagated by Cuttings planted in the Spring a little before the Buds opened; these were placed on a moderate hot Bed, and covered down with Glasses, with which Management they put out Roots freely, and afterward they were gradually hardened to live in the open Air.

The 5th Sort has been lately introduced into the English Gardens, from Paris, where the Plants were raised from Seeds, which were sent from China by the Missionaries. I was favoured with some young Plants by Monsieur Richard, Gardener to the King at Versailles. The two Sorts with white and blue Flowers have succeeded in the Chelsea Garden, but that with red Flowers was injured in the Way and miscarried.

This is propagated by Cuttings which must be planted in the Spring, in Pots, plunging them into a moderate hot Bed, and treating them as the 4th Sort. When the Cuttings are well rooted, they should be carefully taken up, and each planted in a separate small Pot filled with light Earth, and placed in the Shade until they have taken new Root, then they may be removed to a sheltered Situation, placing them with other Greenhouse Plants, where they may remain all the Summer; but in Autumn they must be put into Shelter, for they will not live in the open Air in this Country; but as they cast their Leaves early in Autumn, they must not have much Wet in Winter. The Plants are late in putting out new Leaves in the Spring, and before these appear they have so much the Appearance of dead Plants, that they have been turned out of the Pots by some, supposing they were so.

VITIS. *Tourn. Inst. R. H.* 613. *Tab.* 384. *Lin. Gen. Pl.* 250. The Vine.

The Characters are,

The Flower has a small Empalement indented in 5 Parts; it has 5 small Petals which drop off, and 5 Awl-shaped Stamens, which spread and fall away, terminated by single Summits, with an oval Germen having no Style, crowned by a beaded obtuse Stigma. The Germen afterward turns to an oval roundish Berry with 1 Cell including 5 hard Seeds or Stones.

I shall not trouble the Reader with an Enumeration of all the Sorts of Grapes which are at present known in England, which would swell this Work much beyond its intended Bulk, and be of little Use, since many of them are not worth the Trouble of cultivating; so I shall only select those which ripen pretty well in this Country, or that merit a little Assistance to bring them to Perfection by artificial Heat.

The July Grape, this is called by the French, *Morillon noir batif*. This is a small, round, black Berry, growing loose on the Bunches. The Juice is sugary but has little Flavour; and has no Merit but that of ripening early. It ripens the Beginning of August.

The Black Sweet Water, is a small roundish Berry growing

growing close in the Bunches, which are short. The Skin is thin, the Juice very sweet, and the Birds and Flies are very apt to devour them if they are not guarded. It ripens soon after the other.

The White Sweet Water is a large round Berry when in Perfection, but these are very different in Size on the same Bunch, some of them will be of a large Size, and others extremely small, for which Reason it is not much esteemed. The Juice is sugary, but not vinous. This ripens about the same Time with the former.

The *Chasselas Blanc*, or Royal Muscadine, as it is called by some, is an excellent Grape, the Bunches are generally large, and at the upper Part divide with two smaller side Bunches or Shoulders. The Berries are round, and when perfectly ripe turn of an Amber Colour. The Juice is rich and vinous: it ripens in September, but if carefully preserved they will hang very late and become excellent.

The *Chasselas Musque*, or *Le Cour* Grape, as it is here called, by some called the *Frankindal*, is an excellent Grape, and generally ripens well in England if it has a good aspect Wall. The Berries are very like those of the former in Shape, Size and Colour, but are fleshy and have a little musky Flavour. It ripens at the same Time with the former.

The Black Cluster, or *Munier* Grape, as it is called by the French, from the hoary Down of the Leaves in Summer; it is a good Fruit, and ripens well here. The Bunches are short, the Berries are oval, and are very close to each other, so that many of those which grow on the Inside continue green, when the outer are perfectly ripe. It ripens in September, and is by some called the *Burgundy* Grape.

The *Auverna*, or true *Burgundy* Grape, sometimes called *Black Morillon*, is an indifferent Fruit for the Table, but is esteemed one of the best Sorts for making Wine. The Berries of this are oval, and hang looser on the Bunches than those of the Cluster Grape, so ripen equally, which gives it the Preference.

The *Corinth*, or as it is vulgarly called the Currant Grape, is a small roundish Berry generally without Stone; of a deep black Colour, and much clustered on the Bunches, which are short; it has a sugary Juice, and ripens in September, but will not last long.

The Red *Chasselas* is very like the White in Size and Shape, but is of a dark red Colour; it is a very good Grape, but ripens later than the white, and is pretty rare in England.

The White Muscadine is somewhat like the *Chasselas*, but the Berries are smaller, and hang looser on the Bunches, which are longer, but not so thick as those of the *Chasselas*. The Juice is sweet, but not so rich as the *Chasselas*.

The Black *Frontinac*, or *Muscat noir*, is a round Berry of good Size; the grow loose on the Bunches, yet do not ripen equally. The Bunches are short, the Berries when fully ripe are very black, and are covered with a Meal or Flue, like the black Plums. The Juice of this is very rich and vinous. It ripens the End of September, or the Beginning of October.

The Red *Frontinac*, or *Muscat rouge*, is an excellent Grape when fully ripe, but unless the Season proves very warm they rarely ripen without artificial Heat in

England. The Bunches of this Sort are longer than those of the former; the Berries are large and round; when they are fully ripe, they are of a Brick Colour, but before they are gray with a few dark Stripes, and this is frequently taken for a different Kind, and is commonly called *Grifley Frontinac*; but I am convinced it is the same Grape, the Juice of this has the most vinous Flavour of all the Sorts, and is greatly esteemed in France.

The White *Frontinac* has larger Bunches than either of the former, the Berries are round; and are so closely clustered on the Bunches that unless they are carefully thinned early in the Season, when the Berries are very small, the Sun and Air will be excluded from many of the Berries, so that they will not ripen; and the Moisture will be detained in the Autumn, which will cause them to rot. The Juice of this is excellent, and if the Fruit is perfectly ripe is inferior to none. This the French call *Muscat blanc*.

The *Alexandrian Frontinac* or *Muscat d'Alexandrie* is by some called *Muscat of Jerusalem*. The Berries of this are oval, and hang loose on the Bunches; these are long and not shouldered. There are two Sorts, one with white and the other has red Berries, their Juice is very rich and vinous, but they seldom ripen in England without artificial Heat.

The red and black *Hamburg*, by some called the *Warner* Grape, from the Person who brought them to England, has middle-sized Berries inclining to an oval Shape. The Bunches are large, and their Juice when ripe is sugary, with a vinous Flavour. This ripens in October.

The *St. Peter's* Grape has a large oval Berry of a deep black Colour when ripe. The Bunches are very large, and make a fine Appearance at the Table, but the Juice is not rich, and it ripens late in the Year. The Leaves of this Sort are much more divided than those of the other Sorts, approaching to those of the Parsley-leaved Grape, so it may be distinguished before the Fruit is ripe.

The Claret Grape, *Bourdelaie*, or Verjuice Grape, the Raisin Grape, the striped Grape, and many other Sorts which never come to Perfection here, are not worthy of a Place in Gardens, unless for Variety, for when they have the Assistance of Heat to bring them to Maturity, their Juice is harsh and without Flavour, so they should not occupy the Room of better Fruit.

All the Sorts of Grapes are propagated either from Layers or Cuttings, the former of which is greatly practised in England, but the latter is what I would recommend as being much preferable to the other; for the Roots of Vines do not grow strong and woody, as in most Sorts of Trees, but are long, slender, and pliable; therefore when they are taken out of the Ground, they seldom strike out any Fibres from the weak Roots, which generally shrivel and dry; so that they rather retard than help the Plants in their Growth, by preventing the new Fibres from pushing out; for which Reason I had rather plant a good Cutting than a rooted Plant, provided it be well chosen; and there is little Danger of its not growing.

But as there are few Persons who make choice of proper Cuttings, or at least that form their Cuttings rightly

rightly in *England*, it will be proper to give Directions for this in the first Place, before I proceed. You should always make choice of such Shoots as are strong and well ripened of the last Year's Growth; these should be cut from the old Vine, just below the Place where they are produced, taking, a Knot, or Piece of the two-Years Wood to each, which should be pruned smooth; then you should cut off the upper Part of the Shoots so as to leave the Cutting about 16 Inches long. When the Piece or Knot of old Wood is cut at both Ends, near the young Shoot, the Cutting will resemble a little Mallet; from whence *Columella* gives the Title of *Malleolus* to the Vine Cuttings. In making the Cuttings after this Manner, there can be but one taken from each Shoot; whereas most Persons cut them into Lengths of about a Foot, and plant them all, which is very wrong; for the upper Part of the Shoots are never so well ripened as the lower, which was produced early in the Spring, and has had the whole Summer to harden; so that if they take Root, they never make so good Plants; for the Wood of these Cuttings being spongy and soft, admits the Moisture too freely, whereby the Plants will be luxuriant in Growth; but never so fruitful as such whose Wood is closer and more compact.

When the Cuttings are thus prepared, if they are not then planted they should be placed with their lower Part in the Ground in a dry Soil laying some Litter on their upper Parts to prevent them from drying: In this Situation they may remain till the Beginning of *April* (which is the best Time for planting them), when you should take them out and wash them from the Filth they have contracted; and if you find them very dry, you should let them stand with their lower Parts in Water, 6 or 8 Hours, which will distend their Vessels, and dispose them for taking Root. Then the Ground being before prepared where the Plants designed to remain (whether against Walls, or for Standards (for they should not be removed again), the Cuttings should be planted; but in preparing the Ground, you should consider the Nature of the Soil, which, if strong, and inclinable to Wet, is by no Means proper for Grapes; therefore where it so happens, you should open a Trench where the Cuttings are to be planted, which should be filled with Lime Rubbish, the better to drain off the Moisture; then raise the Border with fresh light Earth about 2 Feet thick; so that it may be at least a Foot above the Level of the Ground; then you should open the Holes at about 6 Feet Distance from each other, putting 1 good strong Cutting into each Hole, which should be laid a little sloping, that their Tops may incline to the Wall; but it must be put in so deep, that the uppermost Eye may be level with the Surface of the Ground; for when any Part of the Cutting is left above Ground, as is the common Method used by the *English* Gardeners, most of the Buds attempt to shoot; so that the Strength of the Cuttings is divided to nourish so many Shoots, which must consequently be weaker than if only one of them grew; whereas, on the contrary, by burying the whole Cutting in the Ground, the Sap is all employed on one single Shoot, which consequently will be much stronger; besides the Sun and Air are apt to dry that Part of the

Cutting which remains above Ground, and so often prevents their Buds from shooting.

Then having placed the Cutting into the Ground, you should fill up the Hole gently, pressing down the Earth with your Foot close about it, and raise a little Hill just on the Top of the Cutting, to cover the upper Eye quite over, which will prevent it from drying, this being done, there is nothing more necessary, but to keep the Ground clear from Weeds, until the Cuttings begin to shoot; at which Time you should look over them carefully to rub off any small Shoots, if such are produced, leaving only the first main Shoot to the Wall; which should be constantly trained up, as it is extended in Length, to prevent its breaking, or hanging down; you must continue to look over these once in about 3 Weeks during the Summer Season, constantly rubbing off all lateral Shoots which are produced leaving only the first main Shoot; and be sure to keep the Ground constantly clear from Weeds, which, if suffered to grow, will exhaust the Goodness of the Soil, and starve the Cuttings.

The *Michaemas* following, if your Cuttings have produced strong Shoots, you should prune them down to two Eyes, which, though by some People may be thought too short, yet I am satisfied, from several Experiments, to be the best Method. The Reason for advising the pruning Vines at this Season, rather than deferring it till Spring, is, because the tender Parts of those young Shoots, if left on, are subject to decay in Winter, for they are apt to grow late in the Year, so the Tops of their Shoots are tender, and the early Frosts will pinch them, and then they frequently are killed down a considerable Length, which weakens their Roots; but if they are cut off early in Autumn, the Wounds will heal over before the bad Weather, and thereby the Roots will be greatly strengthened.

In the Spring, after the cold Weather is past, you must gently dig up the Borders, to loosen the Earth; but you must be very careful in doing this, not to injure the Roots of your Vines; you should also raise the Earth up to the Stems of the Plants, so as to cover the old Wood, but not so deep as to cover either of the Eyes of the last Year's Wood. After this they will require no farther Care until they begin to shoot, when you should look over them carefully, to rub off all weak dangling Shoots, leaving no more than the two Shoots, which are produced from the two Eyes of the last Years Wood, which should be fastened to the Wall; and so from this, until the Vines have done shooting, you should look over them once in 3 Weeks or a Month to rub off all lateral Shoots as they are produced; and to fasten the main Shoots to the Wall, as they are extended in Length, which must not be shortened before the Middle, or latter End of *July*, when it will be proper to nip off their Tops, which will strengthen the lower Eyes; and during the Summer Season, you must constantly keep the Ground clear from Weeds; nor should you permit any Sort of Plants to grow near the Vines; which would not only rob them of Nourishment, but shade the lower Parts of the Shoots, and thereby prevent their ripening; which will not only cause their Wood to be spongy, and luxuriant, but render it less fruitful.

As soon as the Leaves begin to drop in Autumn, you should prune these young Vines again, leaving 3 Buds to each of the Shoots, provided they are strong, otherwise it is better to shorten them down to two Eyes if they are good, for it is a very wrong Practice to leave much Wood upon young Vines, or to leave their Shoots too long, which greatly weakens the Roots; then you should fasten them to the Wall, spreading them out horizontally each Way, that there may be Room to train the new Shoots the following Summer, and in the Spring, dig the Borders as before.

The 3d Season you must go over the Vines again, as soon as they begin to shoot, to rub off all Dangers as before, and train the strong Shoots in their proper Places, which this Year may be supposed to be 2 from each Shoot of the last Year's Wood; but if they attempt to produce a Shoots from one Eye, the weakest of them must be rubbed off, for there should never be more than one allowed to come out of each Eye. If any of them produce Fruit, as many Times they will the third Year, you should not stop them, so soon as is generally practised upon the bearing Shoots of old Vines, but permit them to shoot forward till a Month after *Midsummer*; at which Time you may pinch off the Tops of the Shoots; for if this were done too soon, it would spoil the Buds for the next Year's Wood, which in young Vines must be more carefully preserved than on older Plants, because there are no other Shoots to be laid in for a Supply of Wood, as is commonly practised on old Vines.

During the Summer you must constantly go over your Vines, and displace all weak lateral Shoots as they are produced, and carefully keep the Ground clear from Weeds, as was before directed; that the Shoots may ripen well; which is a material Thing to be observed in most Sorts of Fruit Trees, but especially in Vines; which seldom produce any Fruit from immature Branches. These Things being duly observed, are all that is necessary in the Management of young Vines; I shall therefore proceed to lay down Rules for the Government of grown Vines, which I shall do as briefly as possible. And,

First, Vines rarely produce any bearing Shoots from Wood that is more than one Year old; therefore great Care should be taken to have such Wood in every Part of the Trees; for the Fruit are always produced upon the Shoots of the same Year, which come out from Buds of the last Year's Wood. The Method commonly practised by the Gardeners in *England* is, to shorten the Branches of the same Year's Growth, down to 3 or 4 Eyes, at the Time of pruning; though there are some Persons who leave these Shoots much longer, and affirm that by this Practice they obtain a greater Quantity of Fruit, but however this may be, it is a very wrong Practice, since it is impossible, that one Shoot can nourish 40 or 50 Bunches of Grapes, so well as it can 10 or 12; so that what is gotten in Number, is lost in their Magnitude: besides, the greater Quantity of Fruit there is left on Vines, the later they are ripened, and their Juice is not so rich; and this is well known in the Wine Countries, where there are Laws enacted to direct the Number and Length of Shoots that are to be left upon each Vine, lest by overbearing them, they

not only exhaust and weaken the Roots, but thereby render the Juice weak, and so destroy the Reputation of their Wine.

Wherefore the best Method is, to shorten the bearing Shoots, to about 4 Eyes in Length, because the lowermost seldom is good, and 3 Buds are sufficient, for each of these will produce a Shoot, which generally has 2 or 3 Bunches of Grapes; so that from each of those Shoots there may be expected 6 or 8 Bunches, which is a sufficient Quantity. These Shoots must be laid about 18 Inches asunder; for if they are closer, when the Side Shoots are produced, there will not be Room enough to train them against the Wall, which should always be provided for, and as their Leaves are very large, the Branches should be left at a proportionable Distance from each other, that they may not crowd or shade the Fruit.

At the Winter Pruning of your Vines you should always observe to make the Cut just above the Eye, sloping it backward from it, that if it should bleed, the Sap might not flow upon the Bud, and where there is an Opportunity of cutting down some young Shoots to two Eyes, in order to produce vigorous Shoots for the next Year's Bearing, it should be always done, because in stopping those Shoots which have Fruit upon them as soon as the Grapes are formed, which is frequently practised, it often spoils the Eyes for producing bearing Branches the following Year, and this reserving of new Wood is what the *Vignerons* abroad always practise in their Vine-yards. The best Season for pruning Vines is about the Middle or End of *October*, for the Reasons before laid down.

The latter End of *April*, or the Beginning of *May*, when the Vines begin to shoot, you must carefully look them over, rubbing off all small Buds which may come from the old Wood, which only produce weak dangling Branches, as also when 2 Shoots are produced from the same Bud, the weakest of them should be displaced, which will cause the others to be stronger, and the sooner this is done, the better it is for the Vines.

In the Middle of *May* you must go over them again, rubbing off all the dangling Shoots as before, and at the same Time you must fasten up all the strong Branches, so that they may not hang from the Wall; for if their Shoots hang down, their Leaves will be turned with their upper Surfaces the wrong Way, and when the Shoots are afterwards trained upright, they will have their under Surface upward, and until the Leaves are turned again, and have taken their right Position, the Fruit will not thrive, so that the not observing this Management will cause the Grapes to be a Fortnight or three Weeks later before they ripen; besides, by suffering the Fruit to hang from the Wall, and be shaded with the Closeness of the Branches, it is greatly retarded in its Growth; therefore, during the growing Season, you should constantly look over the Vines, displacing all dangling Branches and wild Wood, and fasten up the other Shoots regularly to the Wall, as they are extended in Length, and towards the Middle of *June* you should stop the bearing Branches, which will strengthen the Fruit, provided you always leave 3 Eyes above the Bunches, for if you stop them too soon, it will injure the Fruit, by taking away that Part of the Branch which is necessary to attract the Nourishment to the Fruit

Fruit, as also to perspire off the Crudities of the Sap, which is not proper for the Fruit to receive.

But although I recommend the stopping those Shoots which have Fruit at this Season, yet this is not to be practised upon those which are intended for bearing the next Year, for these must not be stopped before the Middle of *July*, lest, by stopping them too soon, you cause the Eyes to shoot out strong lateral Branches, whereby they will be greatly injured.

During the Summer Season you should be very careful to rub off all dangling Branches, and train up the Shoots regularly to the Wall as before, which will greatly accelerate the Growth of the Fruit, and also admit the Sun and Air to them, which is absolutely necessary to ripen, and give the Fruit a rich Flavour, but you must never divest the Branches of their Leaves, as is the Practice of some Persons, for although the admitting the Sun is necessary to ripen them, yet if they are too much exposed thereto, their Skins will be tough, and they will rarely ripen; besides, the Leaves being absolutely necessary to nourish the Fruit, by taking them off, the Fruit is starved, and seldom comes to any Size, as I have several Times observed, therefore a great Regard should be had to the Summer Management of the Vines, where Persons are desirous to have their Fruit excellent, and duly ripened.

When the Fruit are all gathered, you should prune the Vines, whereby the Litter of their Leaves will be entirely removed at once, and their Fruit will be the forwarder the succeeding Year, as has been before observed.

As many of the richest and best Sorts of Grapes will not ripen in *England*, unless the Season proves very warm, or the Soil and Situation are very favourable, there have been many hot Walls built to accelerate the ripening of this Fruit, and bring it to full Perfection by artificial Heat, and as these succeed very well, when they are properly contrived, and the Vines rightly managed, I shall here give proper Directions, which, if duly attended to, will be sufficient to instruct Persons in both.

The Method of building hot Walls will be treated under the Article *Wall*, so I shall pass it over in this Place, and proceed to the preparing of the Ground for planting. The Borders against these hot Walls should have the Earth taken out 2 Feet deep (provided the Ground is dry), otherwise one Foot will be sufficient, because in wet Land the Borders should be raised at least 2 Feet above the Level of the Ground, that the Roots of the Vines may not be injured by the Wet. When the Earth is taken out, the Bottom of the Trench should be filled with Stones, Lime, Rubbish, &c. a Foot and a Half or 2 Feet thick, which should be levelled and beaten down pretty hard to prevent the Roots of the Vines from running downward. The Trenches should be made 5 Feet wide at least, otherwise the Roots of the Vines will in a few Years extend themselves beyond the Rubbish, and finding an easy Passage downwards, will run into the moist Ground, and thereby imbibe so much Wet, as to lessen the vinous Flavour of the Grapes, but before the Rubbish is filled into the Trench, it is a better Method to raise a 9 Inch Wall, at 5 Feet Distance from the hot Wall which will keep the Rubbish from intermixing with the neighbouring Earth, and also confine the Roots of the Vines to the

Border in which they are planted, so that they cannot reach to the Moisture of the Ground about them. This 9 Inch Wall should be raised to the Height of the intended Border, so will be of great Use to lay the Plate of Timber of the Frames upon, which will be necessary to cover the Vines when they are forced, whereby the Timbers will be better preserved from rotting, and where the Borders are raised to any considerable Height above the Level of the Ground, these Walls will preserve the Borders from falling down into the Walks, but in carrying up these Walls, it will be proper to leave little Openings, about 8 or 10 Feet Distance, to let the Water pass off, because when the Rubbish at the Bottom of the Trench unites and binds very hard, the Water cannot easily find a Passage through it, therefore it will be the better Method to leave these small Passages in the Wall, lest the Moisture, being confined at Bottom, should be pent up as in a Ditch, which will be of ill Consequence to the Vines.

When the Walls are finished, and thoroughly dry, the Rubbish should be filled in, as before directed; then there should be fresh light Earth laid upon it 2 Feet thick, which will be a sufficient Depth of Soil for the Vines to root in. These Borders should be thus prepared at least a Month or 6 Weeks before the Vines are planted, that they may have Time to settle. The best Time to plant them is about the End of *March*, or the Beginning of *April*, according as the Season proves early or late. These I would also advise to be planted with Cuttings, rather than rooted Plants, for the Reasons before assigned, but there should be 2 Cuttings put into each Hole, or placed at a nearer Distance, lest any of them should fail, for if all should succeed, the weakest of them may be easily drawn out the following Spring. These Cuttings should be well chosen from good bearing Vines, and the Shoots should be well ripened, otherwise they will never make good Plants. The Distance these Vines should be allowed to remain is the same as for common Walls, *i. e.* about 6 Feet. In planting them there should be Holes opened with a Spade, about 14 or 15 Inches deep, for if there be but 3 or 4 Inches of good Earth under the Foot of the Cuttings, it will be sufficient; then the Cuttings should be laid in the Holes a little sloping, and then the Earth should be filled into the Holes, and gently pressed with the Foot to the Cuttings, and raised in a Heap over them, so as just to cover the uppermost Eyes of the Cuttings; afterward lay a little Mulch on the Surface of the Ground about the Cuttings to prevent the Sun and Air from drying the Earth, and if the Spring should prove very dry, they should have some Water once a Week, which will be as often as these Cuttings require it, for nothing will destroy them sooner than too much Water, which rots their Bark, and destroys them. If these Cuttings are well chosen, and the Instructions here laid down duly observed, they will make strong Shoots the first Summer, for I have frequently planted Cuttings which have shot 5 Feet in one Year, but then I carefully rubbed off all the side dangling Shoots as they were produced, and never permitted more than 1 Shoot to remain on each Cutting, which is what should always be observed by those who have the Care of Vines. With this Management there

will be little Hazard of the Cuttings taking Root, for in upwards of 500 Cuttings, which I received from *Italy*, and which had been cut off from the Vines in the Beginning of *November*, wrapped up in Moss, and put on board the Ship (which did not arrive at the Port of *London* until *March*, so that they were full four Months cut off before they were planted,) there were not 20 of the Number failed, and many of them shot above 6 Feet the first Season.

As I have directed the pruning of Vines to be performed in Autumn (which is without Dispute the best Season for this Work,) so, in preserving the Cuttings till the planting Season, I have advised them to be cut to their Lengths, and their Ends laid into the Ground, and then covered with Litter or Moss to keep the Air from them, but since, I have found it a much better Method not to shorten the Shoots, from which the Cuttings are to be made, but to lay their Ends just into the Ground, about 2 Inches deep, and so leave them at full Length, only observing to cover them with dry Litter or Peas Haulm in frosty dry Weather, though in moist Weather the Covering should not remain on, because it would make the Cuttings grow, which would greatly injure them. Then in the Spring, when they are to be planted, they should be taken out of the Ground, and their upper Part cut off, so as to reduce them to about 14 Inches in Length, according to the Distance of the Buds or Eyes, for those Cuttings, whose Buds grow pretty close together, need not be left more than 1 Foot long, but in others 14 or 16 Inches will be full short. The leaving the upper Part of the Shoots on all the Winter is of great Service to the Cuttings, because when they are cut off in Autumn, the Air penetrates the wounded Part, and greatly injures the other Eyes.

The Management of these Vines, for the 3 first Years after planting, being the same as is practised for those against common Walls, I shall not repeat it in this Place, having fully treated of that already, only will observe that, during these 3 Years, the Vines should be encouraged as much as possible, and the Shoots not left too long, nor too many in Number on each Root, that they may be duly ripened and prepared for bearing the fourth Year, which is the soonest they should be forced, for when any Sorts of Fruit Trees are forced by Fire too young, they seldom continue long in Health, so that what Fruit they produce is small, and not well-flavoured; therefore, in being over hasty to save a Year or two, very often the whole Design miscarries, for unless the Trees are in a proper Condition to bear much Fruit, it is not worth while to make Fires for a small Quantity of starved ill tasted Fruit, the Expence and Trouble being the same for 10 or 12 Bunches of Grapes, as it will be for a 100 or more.

These Vines should not be forced every Year, but with good Management they may be forced every other Year, though it would be better, if it were done only every third Year; therefore, in order to have a Supply of Fruit annually, there should be a sufficient Quantity of Walling built to contain as many Vines as will be necessary for 2 or 3 Years, and by making the Frames in Front moveable, they may be shifted from one Part of the Wall to another, as the Vines are alternately

forced; therefore I would advise about 40 Feet Length of Walling to be each Year forced, which is as much as 1 Fire will heat, and when the Vines are in full Bearing, will supply a reasonable Quantity of Grapes for a middling Family, but for great Families twice this Length will not be too much.

In most Places where these hot Walls have been built, they are commonly planted with early Kind of Grapes, in order to have them early in the Season, but this, I think, is hardly worth the Trouble, for it is but of little Consequence to have a few Grapes earlier by a Month or six Weeks, than those against common Walls, therefore I should advise, whenever a Person is willing to be at the Expence of these Walls, that they may be planted with some of the best Kinds of Grapes, which rarely come to any Perfection in this Country without the Assistance of some artificial Heat, of which the following Sorts are the most valuable.

The Red Muscat of *Alexandria*.

The White Muscat of *Alexandria*.

The Red *Frontinac*.

The White *Frontinac*.

The Black *Frontinac*.

When the Vines, which are planted against the hot Walls, are grown to full Bearing, they must be pruned and managed after the same Manner as hath been directed for those against common Walls, with this Difference only, viz. that those Seasons when they are not forced, the Vines should be carefully managed in the Summer for a Supply of good Wood, against the Time of their being forced, so that it will be the better Method to divest the Vines of their Fruit, in order to encourage the Wood, for as few of the Sorts will ripen without Heat, it is not worth while to leave them on the Vines during the Season of resting, except it be the common *Frontinac*, which in a good Season will ripen without artificial Heat, but, even these, I would not advise many Grapes to be left on them during the Years of their resting because as the Design of this is to encourage and strengthen them, therefore all possible Care should be had, that the young Wood is not robbed by overbearing, for those Years when the Vines are forced, the Joints of the young Wood are generally drawn farther asunder, than they ordinarily grow in the open Air, so that when they are forced two or three Years successively, the Vines are so much exhausted, as not to be recovered into a good bearing State for some Years, especially if they are forced early in the Season, or where great Care is not taken in the Summer, to let them have a proper Share of free Air, to prevent their being drawn too much, and also to ripen their Shoots. Those Years when the Vines are forced, the only Care should be to encourage the Fruit, without having much Regard to the Wood, so that every Shoot should be pruned for Fruit, and none of them shortened for a Supply of young Wood, because they may be so managed by pruning in the Years of their resting, as to replenish the Vines with new Wood. Those Vines, which are designed for Forcing in the Spring, should be pruned early the Autumn before, that the Buds, which are left on the Shoots, may receive all possible Nourishment from the Root, and at the same Time the Shoots should be fastened to the

Trelace

Trelace in the Order they are to lie, but the Glasses should not be placed before the Vines, till about the End of *January*, at which Time also the Fires must be lighted, for if they are forced too early in the Year, they will begin to shoot before the Weather will be warm enough to admit Air to the Vines, which will cause the young Shoots to draw out weak, and thereby their Joints will be too far asunder, so consequently there will be fewer Grapes on them, and those Bunches which are produced will be smaller, than when they have a sufficient Quantity of Air admitted to them every Day.

If the Fires are made at the Time before directed, the Vines will begin to shoot the latter End of *February*, which will be six Weeks earlier than they usually come out against the common Walls, so that by the Time that other Vines are shooting, these will be in flower, which will be early enough to ripen any of these Sorts of Grapes perfectly well. The Fires should not be made very strong in these Walls, for if the Air is heated to about ten Degrees above the temperate Point, on the Botanical Thermometers, it will be sufficiently warm to force out the Shoots leisurely, which is much better than to force them violently. These Fires should not be continued all the Day Time, unless the Weather should prove very cold, and the Sun does not shine to warm the Air, at which Times it will be proper to have small Fires continued all the Day, for where the Walls are rightly contrived, a moderate Fire made every Evening, and continued till Ten or Eleven of the Clock at Night, will heat the Wall, and warm the inclosed Air to a proper Temperature, and as these Fires need not be continued longer than about the End of *April* (unless the Spring should prove very cold,) so the Expence of Fuel will not be very great, because they may be contrived to burn either Coal, Wood, Turf, or almost any other Sort of Fuel, though where Coal is to be had reasonable, it makes the evenest and best Fires, and will not require much Attendance.

When the Vines begin to shoot, they must be frequently looked over to fasten the new Shoots to the Trelace, and to rub off all dangling Shoots, in doing of which great Care must be taken, for the Shoots of these forced Vines are very tender, and very subject to break when any Violence is offered. The Shoots should also be trained very regular, so as to lie as near as possible at equal Distances, that they may equally enjoy the Benefit of the Air and Sun, which is absolutely necessary for the Improvement of the Fruit. When the Grapes are formed, the Shoots should be stopped at the second Joint beyond the Fruit, that the Nourishment may not be drawn away from the Fruit in useless Shoots, which must be avoided as much as possible in these forced Vines, upon which no useless Wood should be left, which will shade the Fruit, and exclude the Air from it by their Leaves.

As the Season advances, and the Weather becomes warm, there should be a proportionable Share of free Air admitted to the Vines every Day, which is absolutely necessary to promote the Growth of the Fruit, but the Glasses should be shut close every Night, unless in very hot Weather, otherwise the cold Dews in the Night will retard the Growth of the Fruit. The Bunches of

the *White Frontinac* should also be carefully looked over, and the small Grapes cut out with very narrow-pointed Scissars, in order to thin them, for these Berries grow so close together on the Bunches, that the Moisture is detained between them, which often occasions their rotting, and the Air being excluded from the Middle of the Bunches, the Grapes never ripen equally, which by this Method may be remedied, if done in Time; and as these Grapes are protected by the Glasses from the Blights which frequently take those which are exposed, there will be no Hazard in thinning these Grapes soon after they are set, at which Time it will be much easier to perform this Operation, than when the Grapes are grown larger, and consequently will be closer together; but in doing of this the Bunches must not be roughly handled, for if the Grapes are the least bruised, or the Farina, which there naturally is upon them, be rubbed off, their Skins will harden, and turn of a brown Colour, so the Fruit will never thrive after; therefore the Scissars, which are used for this Purpose, should have very narrow Points, that they may be more easily put between the Grapes, without injuring the remaining ones. The other Sorts of Grapes, which I have recommended for these Walls, do not produce their Fruit so close together on the Bunches, so they will not require this Operation, unless by any Accident they should receive a Blight, which often occasions a great Inequality in the Size of the Grapes, which, whenever it thus happens, will require to be remedied by cutting off the small Grapes, that the Bunches may ripen equally, and appear more sightly.

By the Middle of *June* these Grapes will be almost full-grown, therefore the Glasses may be kept off continually in the Day Time, unless the Season should prove very cold and wet, in which Case they must be kept on, and only opened when the Weather is favourable, for as the racy vinous Flavour of these Fruits is increased by a free Air, so, during the Time of their ripening, they should have as large a Share as the Season will admit to be given them.

Before the Grapes begin to ripen, they must be carefully guarded against Birds, Wasps, and other Insects, otherwise they will be destroyed in a short Time: To prevent which, the Vines should be carefully covered with Nets, so as to exclude the Birds, who make great Havock with the Grapes, by breaking their Skins, and if there are a few Twigs, covered with Birdlime, placed here and there on the Outside of the Nets, it will be of Service, because the Birds are often so bold as to attempt to break the Nets to get to the Grapes, which, if they attempt, they may be so entangled on these Twigs, as not to get loose, and whenever that happens, they should not be disengaged, but suffered to remain to keep off their Companions, and if they get off themselves, it will have the desired Effect, for there will few other Birds come to the same Place that Season, as I have more than once experienced.

As to the Wasps the best Method is to hang up some Phials about half filled with sugared Water, and rub the Necks of the Phials with a little Honey, which will draw all the Wasps and Flies to them, which, by attempting to get at the Liquor, will fall into the Phials, and be drowned; these Phials should be carefully looked

over

over once in three or four Days to take out the Wasps, and destroy them, and to replenish the Phials with Liquor. If this be duly observed, and the Phials placed in Time, before the Grapes are attacked, it will effectually prevent their being injured, but where these Precautions are not taken, the Grapes will be in Danger of being absolutely destroyed, for as these early Grapes will ripen long before any others against common Walls, they will be in much more Danger, there being no other Fruit for them at that Season in the Neighbourhood; whereas, when Grapes in general begin to ripen, there is a Quantity in almost every Garden, so that if they destroy a Part in each Garden, yet there will be a greater Chance to have some escape than where there is only one Wall for them to attack.

These Sorts of Grapes, being forced in the Manner before directed, will begin to ripen early in *August*, especially the Black and Red *Frontinacs*, which will be fit for the Table a Fortnight earlier than the other Sorts; but, as the Design of forcing them is to have them in as great Perfection as possible in this Climate, they should not be gathered until they are thorough ripe, for which Reason some of the latter Sorts should be left on the Vines till *September*, but then the Glasses should be kept over them in wet and cold Weather to protect the Fruit from it, but whenever the Weather is fair, the Glasses must be opened to let in the free Air, otherwise the Damps, arising from the Earth at that Season, will cause a Mouldiness upon the Grapes, which will rot them, so that if the Season should prove very cold and wet, while the Fruit are upon the Vines, it will be proper to make a small Fire every Night to dry off the Damps, and prevent this Injury. Most People in *England* gather their Grapes too soon, never suffering them to remain on the Vines to ripen perfectly, even in the warmest Seasons, when, if they are left on till after *Michaelmas*, they will be good.

Of late Years many Persons have planted Grapes against Espaliers, which in some Places have succeeded very well in good Seasons; but if they are not planted in a good Soil, and to a proper Aspect, and the Sorts rightly chosen, they seldom produce any Fruit which are fit to be eaten. The Soil proper to plant Vines in Espaliers should be the same as is hereafter directed for Vineyards; viz. either a chalky, or gravelly Bottom, with about a Foot and a Half or two Feet of light hazel Earth on the Top, a little sloping to the South or South East, that the Wet may easily find a Passage, so as not to remain on the Ground. In such a Soil situated to the Sun, and screened from cold Winds, there are several Sorts of Grapes, which in warm Seasons will ripen very well in *England*.

But there are some curious Persons who line the back Side of their Espaliers with low Reed Hedges, and others, who do it with thin slit Dales: both of which are a good Defence to the Vines against Blights in the Spring, and accelerate the ripening of the Grapes; so that in tolerable Seasons they will come to good Maturity. Neither of these Methods are very expensive; for these close Fences need not be more than four Feet high; because the Vines being to be managed after the same Manner as those in Vineyards, the Branches which carry the Fruit, will never rise above that Height; for

the bearing Shoots must always be trained about two Feet above the Surface of the Ground; so that the Fruit will be always below the Top of the close Fences and as for the upright Shoots, which are designed for the next Year's bearing, it matters not how much they rise above the Fence; so these may have a loose Trelace, to which they may be fastened, to prevent their overhanging the Fruit.

In the making of these Kinds of close Espaliers for Grapes, it will be proper to lay one strong oaken Plank, (such as are procured in breaking up old Ships or Barges) next the Surface of the Ground, which will last many Years sound, and be very useful in supporting the Fences. If these Planks are fifteen Inches broad, as they may always be readily procured, and the upper Part of the Fence be Reeds, there may be two Lengths cut out of them (provided the Reeds are of a due Length,) without including their Tops. In the Front of these Hedges should be a slight Trelace, to fasten the Vines to, which may be made of Ash Poles. The upright Poles of these Trelaces need not be nearer together than eighteen Inches; and if there are three cross Poles, at about a Foot asunder, they will be sufficient to fasten the bearing Shoots of the Vines at proper Distances in the Manner they are designed to be trained, which should be in such Positions, that the Fruit may not be overshadowed by the Branches; and if the upright Poles are cut so long, as to be a Foot and a Half above the Reeds, they will be tall enough to support the upright Shoots for the next Year's Bearing, which, being trained singly at proper Distances, will have the Advantage of the Sun and Air to ripen the Wood, much better than where four or five Shoots are fastened to the same Pole.

To this Trelace the Reeds may be fastened with Hoops on the back Side, after the Manner usually practised in making common Reed Fences; and if on the Top of the Reeds there is fastened a thin Slip of Deal, to secure their Tops from being broken, it will preserve them a long Time. In making of these Fences, the Reeds should not be laid too thick, for that will not only be more Expence, but will be troublesome to fasten, and not last so long, as when they are made of a moderate Thickness: Therefore as the Reeds will be cut into two Lengths, each Bundle will spread about six Feet in Length; observing first to spread the Bottom Parts of the Bundles, which contain the largest Ends of the Reeds the whole Length; and then the upper Parts of the other Reeds should be reversed, and spread in Front of them, which will make the upper Part of the Fence almost as thick as the Bottom. But neither these, nor the boarded Fences, need be made till the Vines are in full bearing; which will be the fourth or fifth Year after planting, according to the Progress they make; during which Time the Shoots may be supported by any common Stakes, for if the Fences are made before the Vines are planted, as is frequently practised, they will be half decayed by the Time the Vines are fit to bear, and before this Time the Fences are of no Use to them.

The Sorts of Grapes which are proper to plant against these Fences are,

The

The Miller Grape.
 The Chaffelas White.
 The White Muscadine.
 The Sweet Water, and
 Le Cour Grape.

These, if well managed, will ripen very well, provided the Season is tolerably good, and will come in soon after those of the Walls; so that if they are taken care of, by hanging of Mats before them, when the Nights prove cold in Autumn, and are permitted to hang till *October*, the Fruit will prove very good. But where the Sweet Water Grape is planted against these Fences, they will require to be covered in the Spring, at the Time when they are in flower, if there should be cold Nights; otherwise the Bunches will receive a Blast, which will destroy the greatest Part of the Grapes; so that many Times there will not be more than six or eight good Grapes on each Bunch; and the others will be small starved Fruit, hardly so large as the smallest Peas.

In planting these Vines, either for open Espaliers, or the close Fences, it should be performed in the same Manner as for Walls; the Cuttings should be planted 6 Feet asunder; and as these are only designed for the Table, a single Row of Vines of a moderate Length will be sufficient to supply a Family, where there are others against Walls to come before them. But where a Person is inclinable to have more Rows than one, they should be placed at least twelve Feet asunder, that they may equally enjoy the Sun and Air.

As to the pruning and other Management of these Vines, that being the same as for those against Walls, I shall not repeat it in this Place, it being fully treated of before; and to which I have nothing here to add.

Having thus treated of the Management of Vines against Walls and Espaliers, I come next to the Culture of such as are planted in Vineyards; but as the Number of those in *England* is small, and the Experience of them not very great, I shall first subjoin an Account of their planting and managing their Vineyards in *Italy* and *France*, and then shall add some Observations and Experiments of my own upon this Subject. And first I shall insert a curious Account of the Method the *Italians* follow in planting their Vineyards, and making their Wine, which I received from an ingenious Correspondent in that Country, who has some Vineyards of his own, and hath been very exact in his Observations upon the different Methods now practised by the *Italians* in their Vineyards; which is as follows:

The Method of managing their Vineyards, and making their Wines in Italy.

1. As to the Soil; next to that of *Cianti*, which is in a Manner all rocky, they prefer that of the hilly Parts of this Country, which has a warm stony Bottom, with a loamy Superficies; and next to that, such as has a Lime Stone, or chalky Bottom, with a reasonably deep Surface of any good Earth; but in the Plains, where the Wines are nothing comparable to those on the Hills and Mountains, they are forced to content themselves with any tolerably good Sort of Ground, that is neither sandy nor light to Excess; nor too clayey or binding; though a pretty stiff Marl does well enough.

2. As to its Exposure, they choose one that is due South, or that inclines to the West, rather than to the East; and in the Plains, they are obliged to be contented, as will be here related, with a North one for Part of their Vineyards; which they fence however, if not naturally covered with some Wood or adjacent Hill, with either a good Hedge, or a Stone Wall, against the northern Blasts.

3. The Manner of preparing the Ground for planting differs according to the Situation of it; being performed one Way when on Mountains, another when on more moderate Hills, and a different, in some Respects, to that when on a Plain or Level.

In those Plains which are very mountainous and rocky, as also on Hills, where the Bottom of Stone is found near the Superficies, and is hard; they with the Help of proper Instruments, or else with Gunpowder, make a Trench of four Feet and a Half wide, drawing it from East to West (and though it may be near, yet always somewhat under the Summit or Top of the Mountain, to be covered from the North Wind thereby;) and with Part of the Stones which they raise out of the Foundation, they make a dry Wall, (*i. e.* without Mortar) just below the Trench; about twelve Feet below this they make a second Trench in like Manner, levelling the Ground between the Trenches, as well as they can, with Mattocks, Crows of Iron, &c. and so proceed till they have finished the whole Ground they intend to plant.

The Use of those little Walls is, to keep the little Earth there is, from being washed away by impetuous Rains, for the carrying off of which, they make proper Channels at convenient Places; so that the whole Plantation at some Distance, resembles a regular magnificent Pair of Stairs. In which Trenches, at about three Feet Distance one from the other, they plant the Cuttings of Vines, somewhat slanting, about the Depth of two and a Half, or near three Feet; which being dressed as hereafter related, and when they come to their Bearing, being kept of an equal Height, make a most agreeable Prospect.

When the Ground is hilly, but not very mountainous, they dig a Trench about four Feet and a Half deep, and three and a Half wide; and then having thrown the Earth to the Northward, they make a second, with the Earth whereof they fill the first; and so on one under and close to the other, till they have finished the Ground they would plant; the last serving for a Ditch to carry the Water off; into which, at proper Distances, they also make little Ditches to convey the Water; and having so done, and thrown the Earth taken out of the first Trench on the trenched Ground, and levelled it so as to give it an even proper Declivity, they plant it with the Cuttings of Vines in Quadrangles, or other Manner, at the Distance of about five Feet and a Half or more, as they think most proper for their Ground; if stony in the Manner before related, as practised in the Mountains; but if not, then as they do it in the Plains, as will be hereafter described.

When the Vineyard is to be made on a Plain, or an exact Level, having staked the Part out they design for Walks, and laid out the Divisions they intend for Vines, their next Care is, that each of them have a proper Declivity,

clivity, and that there be good Drains to carry Water off; in order to which, they make the first Trench in the Middle of the Division, extending from East to West, of the Depth of four Feet and a Half, and near four Feet in Breadth, throwing the Earth taken out of it Northward; then laying at the Bottom, Stones, Brushwood, Bones, or almost any Sort of Rubbish, to raise and drain it, they proceed to the second Trench, with the Earth of which they fill the first, and so on, till they have finished as far as the second Division extends Southward, laying at the Bottom of every Trench, such Rubbish as they can get; and then removing the Earth taken out of the first Trench over to the South Side already trenched, they proceed in the same Manner on the North Side, as far as the Division extends; when in the last Trench there will naturally remain a Ditch (the Side of which some very curious People wall with a dry Wall) to carry off the Water, whence they take care to make proper Drains to carry it away.

This being done, they proceed to level this Piece of Ground, giving each Side thereof its proper Declivity; so that it somewhat resembles a Roof that is not steep, or as they here term it, a Mule's Back, bearing the following Figure; and this they do to preserve the



Vines they plant the longer, and to make them render better Wines, whilst those that are planted on the Flat, and on the Borders of Ditches, where they are supported by a Sort of Poplar Trees, and serve for the Division of the Corn Fields; though the Vines grow to a great Thickness, and produce much Fruit, yet they render a Wine that is good for little, and the Vines will not last above 35 or 40 Years; whereas what is so planted, being tolerably well looked after, hold good for 140 or 150, and in *Cbianti* they will last above 300, they there accounting those of 100 Years old as young Vines.

N. B. *To defray in good Part the Charge of this expensive Culture, those in the Plains, the very first Year, sow a Hole of Melons between Vine and Vine, which they make about ten Inches Diameter, and a Foot deep, filling about three Fourths of it with good macerated Dung, and the rest with fine good Earth (of which that left by Land Floods is esteemed the best,) in which they put about 15 or 20 Seeds; which being come up, before they put out the domestick Leaf, they nip the Tops of all but two, or at most three, of the strongest Plants, which they leave to bear Fruit, and order accordingly. After which they plant Cauliflowers, or Broccoli of Cauliflowers; and this they also do in the Hills so trenched; but in the Mountains Melons do not well in the Trenches; but Beet Root is often produced, and Cauliflowers.*

4. The Ground being so ordered, where the Vineyard is a Plain, or on the Hills, they proceed to mark it out with Lines according to the Distances they would plant at; endeavouring to do it in Rows about three Feet Vine from Vine; and about four or four and a Half, from Row to Row; but for the most part in a

quadrangular Manner, at the Distance of about four Feet one from the other, drawing Lines lengthways and athwart; in the Crofs they plant the Cut of a Vine in the following Manner:

Having an Iron Crow of an Inch or more Diameter a little pointed at the End, they therewith make a Hole directly down about three Feet and a Half deep; then being provided with an Instrument they call a *Crucciolo*, having a Handle of Wood like that of a large Augur, and the Body of Iron four Feet long, and more than half an Inch in Diameter, at the End of which there is a Nich something like a half Moon, making this Figure,



they, after twisting the End of the Cutting, put it therein, and force it down the Bottom of the Hole, where they then leave it, and afterwards fill up the Vacancy with fine sifted Earth or Sand; observing to tread the Earth close to the Plants, which otherwise (unless it be stiff Land) is often inclinable to be loose and dry, especially if Rain does not soon follow their planting; and it is incredible how many Vines three Persons can in this Manner plant in one Day, viz. upwards of two thousand.

As the Cuttings are of a good Length, there generally remain about two Feet or more of them above the Ground, when planted and sometimes more. When, as it frequently happens, they find the Earth shallow, so that in the trenching they arrive at prime Rock, or a cold bleaky Clay, at the Depth of about three Feet, and therefore they trench not lower, they plant the Depth of two Feet and a Quarter, or two and a Half, shallower than which they never plant, and even then, if the Bottom be Clay, they will do but little; and if rocky, are apt to suffer in the Summer by dry hot Weather, (though if once they strike their Roots in the Rock, they do well enough,) and yield the best Wine that is made in the Plains; which however, though planted with the same Sort of Vines as those of the Mountains, and even of Cuttings brought from thence, never produce near so good Wines as those that grow there, notwithstanding the Grapes ripen three Weeks, if not a Month sooner.

N. B. *This Tillage and Plantation is performed at any Time between November and March, in dry, but not frosty Weather; since then the frozen Earth, in working, being naturally thrown into the Bottom of the Trench, where the Vines are to make their principal Roots, it retains such a Frigidity, that they will thrive but badly in it; which will be the Case also, if the Ground be laboured too wet; wherefore this Trenching, or thorough Tillage, is generally performed in February, after the Severity of the Frosts is over, and may be planted at any Time between that and April; whilst, as for the Cuttings, they are observed to do best when planted as soon as cut off in the Dressing; but if that Conveniency is not to be had, they may be brought from any reasonable Distance, their cut Ends only being tied up, and covered from the Air with Moss, Straw or the like; or if from a greater, with some Earth about*

about them; and may be kept, burying their cut Ends in the Ground, till such Time as they can be used; but just before this is done, it is proper to put them in Water for twelve Hours or more, since that will influence them to strike Root the better.

It is not of much importance, that the Cuttings be from the best Sort of Grapes; though that is best, if easily to be had; but may be from any Vines in the Neighbourhood that thrive well; for afterwards, when they come to their Bearing, you may with little Trouble, ingraft them with Cuttings from Vines of the Sorts you desire; and these will bear some Fruit the very Year they are ingrafted, and most abundantly the next; besides that, the Foot of the Vine or Stock will receive Benefit by this Operation.

5. The Plantation having been made in the Manner before related, the first Culture of it is performed different Ways; which may be termed the Old, and the Modern.

According to the old Way, above a Month after the Planting, when they begin to shoot, they cut off the Tops of the Plants just above the second Eye that is above the Ground, and so let them remain, and shoot out at Pleasure; only after the Melons, &c. (which, as is said before, are planted or raised in the Vacancies) are gathered, they dig, and sow, at proper Distances, the Ground with Beans, Kidney Beans, Turneps, Beets, or the like; and let the Vines shoot and grow at Liberty till the third Year, (that is, when they have been planted three Years complete); then opening the Earth about each Plant in March, or towards the Beginning of April, to the Depth of about a Foot, they, with their Hand, clear away the superficial Roots, and then throw in two handfuls of good half consumed Sheeps Dung, or else of Lupines that have been parboiled; after which with a sharp Instrument, (either a Bill or a strong pruning Knife) and a steady Hand, they cut off the Head of the Plant just below the lowest Shoot, which is sometimes a Finger or two under Ground, rubbing the Part cut over with some of the contiguous Earth; and then upon its shooting, take the principal Shoot (gently cleaning away the rest), and fix it with a green Bulrush to a small Stick, to keep it when tender, from being broken by the Winds, and so let it remain till the next dressing Season; when, having pruned it, leaving but one Eye, they put a Stick that is something more substantial, of between three or four Feet long, to support it from Time to Time, tying the Shoot to it till the Month of July, before the Entrance of the Dog Days, at which Time they nip off the Head of it, which checks its Luxuriancy, and renders the Fruit, which it will then begin to have in small Bunches of nine or ten Grapes each, better and larger, tying the Remainder of the said Shoot to the Stick. In the next Year they order it in the same Manner; and so on till the seventh Year after planting, when it begins to give Fruit to Purpose; and then, at dressing, the generally leave but one Head on the most vigorous Plants, and only two Eyes on that, and stake them with substantial Stakes of more than an Inch Diameter, and near six Feet long; one of which or more, go into the Ground (of which those made of wild Chestnut, the Coppices of which they cut once in seven or eight Years, for resisting both Wet and Dry, are accounted the best;

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and when they begin to shoot, they tie them to these with the small Twigs of Broom or Osiers, and so visiting them frequently in the Course of the Summer, to keep them tied, as also to nip off luxuriant Branches, they let them remain till the Dog Days are over, when they clear them of some of their Leaves, that the Fruit may ripen the better.

N. B. In dressing them after the sixth Year, if they have made more Shoots than one, as most of them will have done, they, as before, cut them all away unless they have Occasion for them to supply the Places of some contiguous Plants that have miscarried; and in moist warm Weather they lay those Shoots down more than a Foot under the Ground, carrying the Heads of them where they design; and this they term Propagation. The best of the Shoots that they cut off from their Vines of seven Years-old or older, they either reserve for any new Plantations that they are to make, or to sell, at about nine Pence Sterling per Hundred.

In Dressing from the seventh Year forward, they reserve the lowest head they can, provided it be vigorous, and endeavour to keep their Vines as low as may be, for the Fruit to enjoy the warm Reflection of the Earth after the Sun Beams are gone from it, to ripen it, and give it Life and Vigour; but not so as to let the Ends of the Bunches touch the Ground, or be so near to it as that they might be dashed therewith by the Rains, since that would be apt to rot the Grapes; whilst in Chianti (where the Vines, though most abundant in the Product of their Fruit, are not so luxuriant of their Shoots, but are easily kept in good Order, by a Hand that is tolerably skilful) it is incredible how exactly even the Vines are kept, about the Height of four Feet from the Ground, which contributes to the making the beautiful Prospect before mentioned.

The modern Way is as follows:

A Month or thereabouts after planting, when the young Plants begin to shoot, they prune them just above the first Eye that remains out of the Earth, whereat, when they (as they naturally will) have made their Shoots, toward the Beginning of June, and so that they can discern which of the several they put out are the strongest, and appear the most thriving, the carefully and gently with the Thumb, rob off all of them except one, which they judge to be the strongest, and for the most Part, the nearest the Ground; which Diligence they renew every eight or ten Days, or oftener, if the Weather chance to be wet, taking away all the new Shoots, which they will abundantly make, ever leaving only the principal Shoot; which, that it may not be prejudiced by the Winds, or the Feet of the People (who frequently, during the Progress of the Melons sown between them, must go to nip off the running Branches, and cultivate them, and who, at the same Time, with great Convenience, do this Work about the Vines), they gently tie, as soon as it is capable of it, to a small Stick; and if, as it often happens, it proves very luxuriant, they nip off its Top; and this Rubbing off of the young Shoots they continue till the Month of October, (though unless there be frequent Rains, there will, about the Beginning of August, be few Shoots to ease them of), whilst sometimes the principal Shoots will

bear Fruit in small Bunches of five or six Grapes each; but as they are always late, they will not ripen; wherefore, that the Strength of the Plant may not be lessened or impaired thereby, they generally crop them off; after which they let the Vines remain till pretty early in the Spring, when the intermediate Crop of Cauliflowers, or Broccoli of Cauliflowers, is taken off; then, in the Month of *February*, they open the Earth about the Foot of each Plant, and clear it of its superficial Roots, and manure it in the Manner before described in the Cultivation of those the old Way. The third Year they dress the Shoot so as to leave but one Eye upon it; and afterwards digging all the Ground in the intermediate Spaces, to requite the Expence of Culture, they sow a Sort of Kidney Beans, which, not rising above a Foot in Height, or scarce so much, does not prejudice the young Vines; to which they now give somewhat more substantial Sticks, whereto they continue to tie them, as also to rub off any new Shoots that they make, visiting them for that End; as also to crop off all the lavish Tops of the Shoots, only three or four Times in the Summer; and the next Year in Dressing, they bestow substantial Stakes on them, whereto they tie them with Broom Twigs, or small Osiers when they begin to be in a pretty good State of Bearing, producing two or three pretty large Bunches of Grapes which (as those of the antecedent Year) ripen well, but come not to the Full of their Bearing to the fourth or fifth Year; however they anticipate those ordered the other Way three or four Years; and this is withal the surer Way of the two; since in cutting off the Heads of the others, many are lost; whereas this Way, few, if any fail.

N. B. *What is before said of a Vine's coming to its full Bearing, is only to be understood in Respect to the Quantity of the Fruit, a little more or less; for as to the Quality, it is generally esteemed to be meliorating till the twentieth Year (being duly cultivated), and the Vines coming from it richer and better; and in Chianti they mix not with their best Grapes, those of the Product of Vines of a less Age than fifteen or sixteen Years, and pretend they are always meliorating for fifty Years.*

The Vines being, by one or other of those Methods, brought to a full bearing State, they must be annually dressed, according to the Vigour of the Plant, and duly staked.

In Dressing, to those of moderate Strength and Vigour, they leave but one Eye, or at most two; and to the most strong and vigorous, but three or four at the very most; and then they tie them not as they do when they are but one or two, but fixing another less substantial Stick in the Ground near the main one, to the Top of which, for its better Support, they tie it with an Osier; they bend down, and fix the Head thereto in the following Form.



And sometimes, when they find one of a very extraordinary Vigour, and that has two good Heads, they

leave them both, and disposing of one in the Manner just before related, the other having fixed another Stick on the other Side of the principal Stake, and tied it thereto, they in the like Manner bend down the Tie thereto, when it comes to form the following Figure.



This done, they continue from Time to Time to bind the new Shoots to the Stakes, and to nip off the Tops of them, when too luxuriant, till towards the Time of ripening. When the Dog Days are past, they disburden them of some of their Leaves, to expose the Fruit then turning Colour, more to the Sun, and to accelerate the Ripening of it.

N. B. *What is said above in Relation to the leaving more than one Head, and the ordering thereof, only relates to such as are in Vineyards on the Plains and Hills; for in the Mountains, as their Stakes are stronger and thicker, they affix some Wood Work to them; on which Frame they run two and sometimes three Heads making the Shape of a Wheel.*

Here also it may be proper to observe, that all Landlords of Vineyards, at letting them, ever reserve to themselves the Privilege of visiting them at their Pleasure, to see if they are duly dressed, and not more Eyes left to a Vine than there ought to be; for it is possible, in three Years Time, only by pruning, to spoil the best Vineyard that is, past almost the Power of Art to recover it, and at the same Time make it yield much Wine; for it is but leaving instead of one or two Eyes, five or six; and of three or four, eight or nine, and it will be reduced unto so weak and exhausted a State, and the Vines so run into Wood, that it will be past recovery, and the only Method is to cut the Vines down a Foot or six Inches under Ground and rear up a new Shoot, which, besides the Time that will be lost in so doing, will hardly, after all, prove effectual. And this Manner of pernicious Pruning the Italians call a *Lascia Podera*, which, in English, is *Quit Farm*, which is a proper Term enough.

As for the Time of dressing Vines, if it may properly be so called, there is nothing wherein those People differ more, some performing it immediately after the Grapes are gathered, as in *Carignano* and *Val d'Arno*; others do it at all Times, as their Conveniency permits, and if the Season is mild and open (leaving their youngest Vines till the last), from *November* to *March*, and in *Chianti*, as the Region is colder, and their Vines late to move, they do it late in the Month of *March*, and even to the Beginning of *April*; others again do it at twice, in *November*, when they leave an Eye extraordinary, and in *March* they cut off that extraordinary Eye, which last Method seems to be the best, though, to have Cuttings for any new Plantation, it can only properly be done in *February* or *March*.

As to sowing in their Vineyards, they also differ as much. In *Chianti*, they leave a Space of about three Feet from their Vines, from thence to the low Wall, many

many sow Wheat, and though the Soil seems to be little else but Stones, and such as only can be worked by a Mattock, yet it bears prodigious Crops, thirteen or twenty for one. Others again, in that Space, will only sow the low Sorts of Kidney Beans, Lentils, and such low Plants, and others again will not sow any, the least Thing at all, as in the general they do not in the Vineyards on the Hills, but in the Plains, after the Heads of their Vines are risen so high, as to be higher than the Tops of Beans, they make no Difficulty, between every Row of Vines, to sow a Row of them, as the most scrupulous do not, to sow late in *April* a Row of low Kidney Beans; whilst some, of late, laying two Rows of Vines into one, whereof, with strong Stakes and Canes, they make a Sort of *Espaliers*, and in the Middle, (that is between Row and Row) being near four Feet from each, plant a Row of Artichokes, which, they say, being well dug in their proper Seasons, Part of the Nourishment going to the Vines, does them more Good than Harm.

As for their Season of digging their Vineyards, they all agree that the later it is done in the Year, the better it is, wherefore, in the Places where they sow nothing, they let that Work alone till the latter End of *April*; or Beginning of *May*, when, according to the Nature of the Ground, they do it with the Spade or Mattock. And again, the more especially to kill the Weeds, and forward the ripening of the Plants, they stir it with a strong Hoe or Mattock, and, when they can, with a Spade in the Dog Days; but in so doing they take a most particular Care, that they touch not any of the Roots of the Vines, for that, if it did not kill them, would at least make them wither, and spoil their Fruit.

6. As for manuring their Vineyards, in all Parts, when they are in a bearing Condition, the practise it but once in five or six Years, when they open the Earth about the Roots, and taking away the small ones, which they may have made towards the Superficies, they throw in a Handful or two of Sheeps Dung, or of that of Goats or Deer, or if any of these are not easily, or in sufficient Quantity, to be had, then, of parboiled Lupines, which, although agreeable to the Vine, yet being of little Substance, must be the oftener repeated, every three Years at least, when they cover it again, and this they perform in the Months of *October* and *November*, that the Winter Rains falling thereon may make it descend to the utmost Fibres of the Roots, and afford them Nourishment.

7. The Season for gathering the Grapes, and making the Vintage, is very uncertain, depending upon the Weather that has been the preceding Spring and Summer, which makes it sooner or later fifteen or twenty Days in *Chianti*. When the Season has been good, they begin to cut their Grapes about *Michaelmas*, and in the Plains a Week or ten Days sooner. In this they every where govern themselves according to the Ripeness of their Grapes, and the Prospect of the Weather, aiming to have a perfect dry Season to do it in.

8. The Grapes being of a due Ripeness, and the Weather warm and dry, as soon as the Sun or Wind has dried up the Dew that was on them, they cut them, and put them into Piggins, and carry them, if at a Distance, on Mules, or, if near, between two Men,

to the Wine Vat, and then, either bruising them to Mash in the said Piggins with a Club, throw them directly therein, or else into a Thing resembling a very large Hopper, with a Grate lengthwise; then Boards being placed over the Vat, a Lad with his Feet treads them out, the Juice, Husks, Stones, and Stalks all passing through the Grate into the Vat, and so they continue to do till the Vat (which usually contains from four to five Tons, sometimes eight, ten, nay, as far as fifteen or twenty in some large Vineyards, in which there are sometimes several of them) is full, when immediately, or sometimes in a few Hours before they fill it, it will set a boiling, which raises the Husks, Stalks, and Stones to the Top, and these make a thick Crust, and thus it continues boiling for many Days, more or less, according to the Strength of it, till it be fit to be drawn off, which is to be distinguished by the Palate, wherein the greatest Skill in making Wine consists. The low Wines of the Plains are ready in about ten Days, those of the Hills in about fifteen, of the Mountains in *Chianti* eighteen or twenty, and sometimes more; in the hastening or retarding whereof the Weather has some Share, so that when they are near ready, they taste them every eight Hours.

N. B. *The more the Wines boil, the drier they will be, the Colour deeper, and the less, the sweeter and paler; and what is said above, is to be understood of Red Wines, which are the chief Produce of this Country, whilst to make their strong White Wines or Muskadines, they gather their Grapes carefully, and lay them three or four Days or more in the Sun, taking Care to carry them within Doors, or under Shelters, in the Night Time, that so no Dew may fall on them.*

And when they are put into the Vat, they let them boil but little, five or six Days at most, and then put them into the Cask, shifting them from one Cask to another, twice or thrice, to make them become fine, and for the Verdea or White Florence, as it is called, they draw it off from the Vat almost as soon as it begins to boil, and has raised the Crust, and then letting it boil in the Cask into which they have drawn it, thirty-six Hours, or at most two Days, they shift it into another, and in a few Hours into a third and fourth, to check and prevent the Fermentation, which gives it the Sweetness it has, but then it is never perfectly fine, though some People both in Italy and England, especially among the Women, are very fond of it.

N. B. *Those Grapes at the End of the Bunches are weaker in Quality, as well as less ripe, than those that grow nigher to the Stalk, and therefore some extreme curious Persons, to make a small Quantity of very choice Wines, cut them off, and make a Wine by itself, which is much inferior to that which is made of the upper Part of the Bunch. This Practice, though attended with Trouble, may be recommended for a larger Parcel, in such Years as the Grapes are hardly ripe, to have some Wine, at least, in Perfection.*

N. B. *Those Persons who value themselves on making the best Wines, and endeavour to keep up the Reputation of their Vineyards and Cellars, in cutting their Grapes, leave the unripe, or those that are infected with the Rotteness, together till the last, and with them make a Vat, or more, by themselves, of Vin Scauro, or Refuse Wine, which serves for common Use, for which also they mix*

Water with the Bottom of their Vats, and the Husks, &c. and make a pleasant brisk Drink much preferable to Water Cyder, but the Weather, once coming in warm, turns it eager and undrinkable.

9. When the Wines are found to be ready, they proceed to draw them off, which are now properly called Wines (before which they are termed *Mosto*, i. e. in *English* Wort), for which Purpose, within three or four Inches of the Bottom of the Vat, there is a Cock fixed therein. When in small Barrels, they carry and put it into the large Butts, which, in *Chianti*, hold, some of them, seven or eight Tons, but generally two or three Tons, made of thick Chestnut, the Staves being more than an Inch and a Half thick, and more than twice as high as they are long, which they never wash, but having left a Gallon or two, it may be, three or four, of Wine in them, when they draw it off the Spring or Summer before, when they are about filling them again to clear them out, they send in a Lad at the Door, which is made in the Head of the Cask, to do it with a Sponge, and to wash it with some new Wine, and this without wiping off any of the Argol, which they think preserves the Wine the better.

In which Casks, which last many Years, (and have Argol in them of the Thickness sometimes of three or four Inches) they let them remain, till they have an Opportunity of selling them, taking Care to keep them full quite to the Bung with a wooden Stopper: This is what they practise in *Chianti*, where the best Wines are made, and whence, from those Butts, they are drawn into Flasks, and carried, at the Expence of about a Crown for a Mule-load, to *Florence*, in order for Exportation, but in other Places they draw them off into less Casks, of which Wines, except some *Carniguano's*, and those of *Val d'Arno*, few or none are exported, but serve for the Consumption of the Country. Some of these have a pleasant Flavour and briskness, though of no great Body, many of which will not keep the Summer over, except in cool Cellars, in the Places where made, such is the nice Nature of this Country Wines in general. Nor are the choicest *Chianti's* exempt, for at two Seasons of the Year, the Beginning of *June* and *September*, the one when the Grapes are in flower, and the other when they begin to ripen, some, even of the best Wines, are apt to change, especially at this latter Season; not that they turn eager, but take a most unpleasant Taste, which renders them unfit, not only for Drinking, but even to make Vinegar of, and is called the *Settembrino*. And what is most strange, is, that one Cask drawn out of the same Vat shall be infected, and another not, but be perfectly good, and yet have both been kept in the same Cellar too.

As this Change happens not to Wine in Flasks, though that will turn eager, I am apt to attribute it to some Fault in filling of the Cask, which must always be kept full, which either by letting alone too long, till the Decrease be too great, and the Scum that there naturally is on all Wine, thereby being too much dilated, is subject to break, or else being broken by hasty filling up, gives it that vile Taste of a rotten Vine Leaf.

But against this there is a very strong Objection, that this Defect seizes the Wine at a particular Season, in

September, over which if it gets, it will hold good for many Years.

As for the Time that the Wines are fit to drink, the poorer Sort of People drink that of the Plains almost as soon as drawn off, but from the 11th of *November*, may be said to be its proper Season.

Those of the Hills are a very pleasant Drink about *Christmas*, and during the Spring, but till *June* the *Chianti's* are not to be esteemed fit for drinking, though they are fit for Exportation in Butts in *December*, and in the Flasks and Chests about the Beginning of *February*, but if sooner shipped off in that Manner, though apparently fine, there will be a Sediment in the Flasks.

The Art of brewing Wines (further than the throwing into each great Butt the Quantity of two or three Hatfuls of the choicest Grapes they had preserved, and laid on Mats in the Sun for that Purpose, which were picked from the Stalks, and are esteemed proper for their Wines to feed on, and which they call *Governo*) was not known in *Chianti* (though the Hosts here practised something like it, mixing the small Wines of this Country with the strong ones of other Parts, and fining their White Wines with Hinglass, Whites of Eggs, Lime, and the like, and were thought to put Allum into the Red Wines to preserve them, and promote a Thirst in their Guests) till on the breaking out of the *French War*, an *English* Merchant from *Bordeaux* came into these Parts, with a View to accommodate the Wines which were made in the best Parts of *Chianti*, and were naturally of a true bright Ruby, with a pleasant Flavour, and a silky Softness, to the *English* Palates, then in Love with the deep-coloured rough Clarets, who instructed them first in the making of Black Wines with the *Labrusco* or wild Grape, which, being mixed with the *Chianti's*, gave them a deeper Colour, and a rougher Taste, and being liked in *England*, gave the first Occasion to great Quantities being sent thither every Year in Casks, in making of which the said Gentleman was the first that instructed them, for before their Casks were, as above related, very unwieldy. This put them also (there being a Demand for their Wines) upon encreasing and enlarging their Cultivations, and making some of them in such Places, as the Exposition was not very proper for, as also to cultivate in Vineyards the said *Labrusco* or wild Grape, and which certainly was the most proper to mix with their other Grapes in the Vat, boiling them together. So all succeeded pretty well till the Year 1607, when the Vintage proving very bad, and there being a great Demand of their Wines for *England*, by mixing the low Wines with the high ones of *Chianti*, which that Season were not very good, they brought these Wines into such a Disreputation, that they have never been able to regain their Credit, though they have since, many Times, had those that are good.

At present, therefore, what goes for *England* is chiefly in Chests, and no more black Wines, as used to be formerly, and these are sent just as they are made, but still in *Chianti*, as they have Cultivations of the *Brusco* Grape (which however is much different from the wild one, and becomes much larger and more generous), they continue to mix them with other Grapes, which gives

gives the great Colour as well as Roughness to their Wines, and is agreeable enough to the *Englisb* Taste.

Having thus acquainted you with what I know and can learn in relation to the making and managing of Vineyards, and the Wines they produce, it remains for me to add an Evil, that, besides the ordinary ones of Hails, Storms, and Frosts, attends the Cultivation of Vines in *Chianti*, and the Parts contiguous, for in the Plains there is no such Thing, and that is a very small Kind of blackish, or very dark green Caterpillar, which, in the Month of *May*, attacks the young Shoots of the Vines, when the Grapes are in Embryo, and destroys them, for which however they have a most certain Remedy, which is to make a little Ring of Birdlime round the Foot of each Vine, about eight Inches above the Ground, which none of these noxious Insects (which, I presume, proceed from the Earth, and are not brought in the Air, as some of the like are thought to be, though these come generally with an easterly dry Wind) being able to pass, most effectually does the Business; and as they in that Region come almost every Year, the Trouble of so providing against them is become habitual to the Cultivators.

The Manner of making Wine in Champaign, and how it may be propagated in other Provinces, to bring it to Perfection.

Wine is so delicate a Liquor, and an Aliment so proper to give Strength, and to preserve Health, if used with Moderation, that one may very well wonder, that in most of the Provinces of *France*, they make it with so much Negligence, in all those Places, where it might be excellent.

The *Champenois* are exempted from this Reproach, and, whether it be from a Delicacy of Taste, or a Desire of making an Advantage of their Wines, or a Facility in rendering them better, they have been always more industrious to make them more exquisite, than those of the other Provinces of the Kingdom.

It is true, it is scarce eighty Years since they have studied to make pale Wine, which is very near white, but before, their Red Wine was made with more Care and Neatness, than any other of the Wines of the Kingdom.

I shall not enter upon the ancient or modern Dispute, as to the Preference between the Wines of *Champaign* and *Burgundy*; but content myself with taking Notice of all that the People of *Champaign* have invented to give the Fineness and Agreeableness to their Wines; and by the Observation, that may be made therefrom, it will be easy to see that the same may be imitated in other Provinces, so as to come pretty near that Lightness and Exquisiteness.

If these Essays shall give Hopes of Success for the future, the Wines of those Provinces might be brought to Perfection by Degrees where they might be Delicious, and where they are but Poor, because they have never studied to give them that Fineness.

In order to have the Wine excellent, the Vines ought to be well exposed to the Sun, especially to the South, and also on the Decline, or in the Manner of a little Hill, rather than on a Plain. Vines should be well chosen, and should be such as generally produce none but small black Grapes: The Bottom of the Soil

should be Good, a little Stony, and not naturally Moist. The Grain of the Soil of *Champaign* is very fine, and has a singular Quality that is not found in other Provinces.

As these Kinds of Lands are light, there is Occasion to dung them from Time to Time, and to lay on new Earth, but the Dinging ought to be sparingly done, for too much of it will render the Wine soft and insipid, and apt to be ropy; it ought to be commonly Cow Dung, because that is not so hot as Horse Dung. In strong Lands it may be mingled with Horse Dung and Sheeps Dung, provided that the Horse Dung be so rotten, that it may be reduced to a Powder, and that there be but one half as much as of the Cow Dung, otherwise it would burn the Vines. Let it be laid on a Trench or Pit, and mix one Layer of Dung, and another of new Earth, and let it lie and rot during a whole Winter, and toward the Month of *February* take from thence half a Basket for every Vine, especially for each new Plant, to help them to push forth. It is sufficient for a Vineyard to be dunged once in eight or ten Years, or an eighth or a tenth Part every Year.

After the Dung has been carried, the Vines ought to be opened round about, and a little Trench to be made round the Foot of the Vine, in order to bury the Dung at a proper Time.

Divers Persons leave it there many Weeks before they bury it, but this is not the best Way, for the Air, the Cold, or the Sun, will be apt to dissipate the most subtle Substance of it, but when it is neither too cold, nor too hot, it may be left open eight or ten Days to exhale its ill Savour, especially the Dung of Sheep.

They give to a Vine four ordinary Dressings, according to their Seasons, but it is proper to take Notice of one Thing, which is scarcely observed in *Champaign*, which is, that they cut their Vines in the Month of *February*, and even in *January*, instead of which, they ought never to begin to cut them till after the 14th of *February*: When they are cut before, they push forth sooner, and are exposed to Injury, and are sometimes killed, if any hoar Frosts come presently after they have been cut, but when they stay till after the 14th of the Month of *February*, there is no Danger of their being injured by the Frosts.

The Covetousness of *Vignerons* leaves them to undertake the Cultivation of more Vines than they well can manage, and for this Reason they cut their Vines in *January*, which does an infinite Injury to them, and to the greatest Part of the Plants, which they are sensible of for many Years.

In *Champaign* they cultivate two Sorts of Vines, which they call the high Vines, and the low Vines. The high Vines are such as they leave to grow in those Places that are less fine, to the Height of four or five Feet; the low Vines are those which they do not suffer to grow above three Feet high; these they interr, or *ravale*, according to the Country Term, every Year, so as to leave but a little of the End to appear, which is repeated annually.

The high Vines produce plentifully, and give often seven or eight Pieces of Wine an Arpent; the low Vines produce but little, but then the Wine is much more delicate;

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delicate; they often do not give above two Pieces of Wine an Arpent, oftentimes less, seldom three, but much seldomer four.

In order that the Wine may be the finer, all the Vines which give the white Grapes must be taken away, and those also that give the large black Grapes, but one need not pluck these up, but graft them.

But sometimes these Grafts will not succeed, which being observed, they must be plucked up, and new ones, that have a Root, set in their Room, which they choose out of the Nurseries, that are common in the Country. The ordinarily purchase these Plants for a Pistole a Thousand.

A private Man, that has a great many Vines, may make himself Nurseries.

These Plants, that have a Root, are put into the Earth, in the Middle of a great Hole, about a Foot deep, which they make with a Stake, or strait Mattock, or Pickax, and these produce sooner than the others, which have no Root. A Plant that has a Root begins to give Wine a little the third Year, indifferently the fourth and fifth, and in Abundance in the following Years, and so for above sixty Years.

These new Plants ought to be dunged the second Year, and in the sixth Year, and afterwards in the eighth and tenth as other Vines.

It will be to the Purpose, every Year, to pull up Part of the old Plants, which take up Room, and produce little or nothing, and by this means a Vineyard will be constantly renewed, as one may say, and in a perfect good Condition.

When there are Dews or Humidities in *May*, *June*, and *September*, the *Vignerons* must not be suffered to enter the Vineyards in a Morning, for the Dews of these Months are commonly very cold, if the Sun do not draw them up, which burns the Leaves of the Vines which are touched before they are drawn up.

It is very essential not to enter the Vineyards at the Time when there is hoar Frost, or Showers attended with Frost, for this will certainly kill the Vines.

The Vineyards must be weeded now and then, and if there be any Beetles, which are pernicious Animals to Plants, they must be picked off, and put into Sacks, and burnt at some Distance from the Vineyard, and the Ashes buried.

About the End of *June*, and also of the Month of *May*, according as the Vineyard is advanced, it is necessary to cut off the End of each Twig, that the Plant may grow no more in Height, and that it may convey all its Nourishment to the Grapes. It is enough, if it have two Feet and a Half, or three at most, above Ground; all the rest is to be cut off, as must also the Tops or Ends of the young Shoots, which proceed from the Bottom or Sides of the Stocks. This ought to be done twice, thrice, or four Times in a Summer, according as the Vines put forth, more or less, in certain Years.

In the Spring Season they put a Prop to every Vine to support it; they ought to be chosen, as much as may be, of Oak, and to procure them of the Quarter or Heart thereof, if you are willing to go to the Charge of it. These will last above twenty Years, and when they are once made sharp, they will always keep so,

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for when they begin to rot, they perish equally throughout, and remain always pointed. The other last scarce four or five Years, and the Masters must have an Eye over the Servants when they sharpen them yearly, that they do not cut them too much, and make them too short, and that they do not break a great many that might serve, for oftentimes in cutting off that which is rotted, they cut off two or three Inches of that which is sound, which prejudices it as to Duration. They call these Props Foot Props.

When a Vineyard has been cultivated and managed during the Summer after the accustomed Manner, and the Vintage Time approaches, when they have made choice of and prepared a new Cask that will contain it, and when the Press has been washed, cleaned, and rubbed over, you must be very watchful to find when the Grapes are come to Maturity, for if they are too ripe, the Wine will not be sufficiently strong; if they are too green, it will be hard, more difficult, and longer before it is fit to be drank.

In the Provinces of *Languedoc* and *Provence* the Grapes have too large Stones; they have too many white ones; they suffer them to be too ripe, which gives them over much Liqueur; they let their Stocks grow to be too old, and do not renew them often enough; they are planted for the most part upon too good Bottoms, or too moist, and have not an Aspect of the Sun good enough.

To make an excellent Wine of the first Pressing, having first well examined the Maturity of the Grapes, you ought to endeavour not to gather them but on Days that are very dewy, and in hot Years, after a little Rain, when you can be so happy as to have it. As the Grapes are not ripe till toward the End of *September*, and sometimes the Beginning of *October*, Dew is rarely wanting in Vintage Time. This Dew gives the Grapes a Flower or *Farina* on the Outside, which they call *Azur*, and inwardly a Freshness, which causes that it doth not heat very easily, and that the Wine is not coloured.

It is very lucky, if there chances to be a misty Day in dry Years, which now and then happens, for the Wine is not only thence more white and delicate, but the Quantity is by much the greater, being augmented by near one fourth Part. A private Person, who has but twelve Pieces of Wine, in gathering his Vintage in a Morning which has the Sun without Dew, will have sixteen or seventeen, if the Morning be misty, and fourteen or fifteen, if it has no Mist, but yet has a good Dew; the Reason of this is, that the Dew, and, above all, the Mist, renders the Grapes tender, so that the whole in a Manner turns into Wine.

The Wine, produced from the Grapes that have not been warmed the Moment they are cut, will still remain much paler, whereas, when the Sun has warmed the Substance of the Grape, it will become more red by the Motion of the Parts, but the Quantity will be lessened either by Reason of Transpiration, or because the Rind has been thickened and hardened by the Sun, whereby it yields its Juice with more Difficulty. This, Experience has taught, is of so much the more Concern, by how much the more certain it is.

They agree in *Champaign* that the Wine, which they call

call River Wine, is ordinarily paler than that of the Mountains, but they do not give the Reason for it. I believe the Vineyards that are near a River enjoy all the Night a fresh Air, which the River exhales, whereas the Vineyards of Mountains do not respire, during the Night, that Warmth which proceeds from the Exhalations of the Earth, and it is that which makes the Colour more or less; also when they Years are very hot, they cannot, either to those of the Rivers, or of the Mountains, warrant the Colour, and when the Years are cold, neither the Wines of the Mountains, nor those of the Rivers, are coloured; the Reason is the same, because the Wines of the Rivers are more soft, forward, and sooner fit for drinking, than the others that are harder, more heady, and later fit.

They gather not all the Grapes without Distinction, neither at all Hours in the Day, but they choose the ripest and bluest; those are the best, and make the most exquisite Wine, whose Berries grow not too close together, but are a little separated, whereby they ripen perfectly well, for those that are close joined together never ripen thoroughly; they cut them with a small crooked Knife, with as much Neatness, and as little of the Tail, as they can, and they lay them very gently on the Baskets, so as not to bruise one Grape.

With thirty Grape-gatherers they will run over a Vineyard of thirty Arpents in three or four Hours to make one first Pressing of ten or twelve Pieces.

In wet Years great Care should be taken not to put any Grape that is spoiled into the Baskets, and at all Times you must be very careful to cut away the rotten Grapes, or those that are bruised, or quite dried up, but you must never pull them off the Bunches.

They begin the gathering of Grapes half an Hour after Sun-rising, and, if the Sun is not clouded, and is a little hot about nine or ten o'Clock, they leave off gathering, and make their Sack, which is one of the first Pressing, because after this Hour, the Grape being warm, the Wine will be of a red Colour or Teint, and will be a long while very heady.

Upon these Occasions they get a great Number of Gatherers to be able to make up a Sack for a Pressing in two or three Hours; if it be overcast, they may gather the whole Day, because the Grape will preserve its Freshness upon the Stock.

The Gatherers and the Pressers ought to take great Care that the Grapes be neither foul nor heated when they are pressed, and also, that the Grapes have their Flower under the Press.

When the Press is near the Vineyard, it is easy to prevent the Wine from having a Colour, because the Grapes may be carried gently and neatly in a little Time, but when they are two or three Leagues off, they being obliged to send the Grapes in Casks, and in Carts, to press it as soon as may be, it is hardly to be avoided but that the Wine will be coloured, except in some very moist and cold Years.

This is a certain Principle, that when the Grapes are cut, the sooner they are pressed, the more pale and delicate is the Wine, for by how much the more Wine stands upon the Marc, the redder it is, so that it is of great Importance to hasten the gathering of the Grapes, and pressing of them.

The Presses of *Champaign* are very commodious. The particular Persons, that have many Vineyards of their own, have them in or near the same Vineyards; in small Places the Presses are Bannauz, which are of different Sizes and Fashions. An exact Description of these several Presses will be inserted in the Article of Wines.

The small ones are about seven Feet and a Quarter, the middle ones about ten or twelve, the large ones fifteen or eighteen; the least, which they call *Étiquets*, cost seven or eight hundred Livres, the second, which they call a Cage or a Teissons, about two thousand Franks, the large ones a thousand Crowns, and sometimes more, according as the Wood is cheaper or dearer in certain Places. In *Languedoc* and *Provence*, where Wood is scarce, these Sorts of Presses cost a very great Price, and but few Persons are in Circumstances to be at the Charge of them.

When the Grapes have been put under the Press, or on the Marc, they put three great Rods or Poles of ten or twelve Inches round upon them, one at either End in Length, and the third in the Middle on the same Side; these at the Extremities serve to describe the Lines which they ought to follow with their cutting Shovels in cutting the Marc, the Substance squeezed on two Sides; after the Cut is made, they lay upon these Poles, and on the Grapes, Planks of the Size of the Press; and upon these Planks half Beams of eight or nine Inches square, which they call *Moyaux*, at a Foot Distance one from the other; they put four or five Rows of these *Moyaux* across, one upon another, which elevate it with the Bag about four or five Feet, and they let down upon the whole three or four great Beams of an immense Weight, which are placed in the Middle of the Press across, and borne up at one End by two strong Side Beams which are sunk fifteen or twenty Feet in the Ground, and which are fastened to the Bases which cross them; at the other End there is a Cage, as they call it, or a Wheel with a Screw, to raise or lower these great Beams upon the *Moyaux*, and thus to press the Grapes; then the presently raise, by the Means of a Screw, the End of the Trees on the Side of the Wheel, or of the Cage, which lowers the other End of the Cheeks or Side Beams; then they drive with a great Mallet two or four wooden Quoins between the Notch, which is in the Side Beams or Cheeks; and these Beams are also lowered to keep them in their Position, and to prevent them from rising: and after this they lower the other End by the Aid of the Screw, which serves also to raise it.

They use in these Presses large Steel Shovels, about a Foot in Breadth, and one and a Half in Depth, very heavy, and sharp at the Bottom to cut the Marc of the Grapes easily at the four Sides.

The first Time they lower the great Beams upon the Grapes, they call the Wine that runs out, the Wine of Goute, because it is the finest and most exquisite in the Grape. This Wine is very thin, and has not Body enough: Some call this first Pressing *l'Abaissement*; this must be done with a great deal of Dexterity and Briskness, that the Beams may be raised immediately, to thrust back to the Middle instantly all the Grapes which are slipped to the Sides of the Press, that they may be briskly

briskly pressed the second or third Time. They call these two other Lowerings of the Beams, the first and second Cutting; they must be done in less than an Hour, if you would have the Wine very pale; because Time is not to be given the Grapes to heat, nor the Liquor to remain upon the Marc.

They ordinarily mix the Wine of the *Abaissement*, or first Lowering, with that of the first and second Cut; and sometimes, but very rarely, according as the Years are more or less hot; and thence they call a Wine of the first Pressing, Fine.

Some preserve one or two *Carteaux*, of the first Taste, which is that of the first Lowering, by itself; but it is too small or thin, and has not a sufficient Body for keeping for Transportation.

There are some skilful Persons who pretend, that the first Lowerings of the Wines ought not to be mixed but with those of the first Cut, because that is much more delicate than that of the second or third; and that besides there is Time enough to mix them afterwards, if they are found to be too thin and pale enough; and the rather, because there is no Remedy, if it be done at the first.

At every Cut they raise the great Beams, and they take away all the *Moyaux* with the Planks, and the Rods that are immediately on the Grapes, or upon the Marc; with these Steel cutting Shovels, they cut the Marc on four Sides, and they cast down with their wooden Shovels that which is cut, and spread it even all over the Square, to the End that it may not disperse so easily; that is to say, in those Presses which they call *Etiquets*; they take Care, that the Wheel which is upon the Middle may be made to bear, especially upon the Rammer, over all the Breadth, in such Manner that the Bag may be equal.

Instead of the Presses, a Cage, or Teissons, as the Beams bear more upon the Side of the Wheel than on the Corners, there must needs be more of the Marc when the Bag is placed sloping toward the Wheel than toward the Side of the Quoins, it will be easily comprehended by viewing the Descriptions of the different Presses. It is also to be observed, that every Time they cut the Grapes, or the Marc, they raise up the Bag, because it has always a certain Elevation, in such Sort, that it is one Third less at the Bottom, than at the Top.

The second Cut is more plentiful than the first Lowering, and the first Cut; because the Grapes begin to be well bruised; and they do not slip so much to the Sides.

The Wine strains from the Press into a Puncheon having the Head staved out, or some other large Vessel prepared for the Purpose, and sunk into the Ground on the Foreside to receive it; it appears at first drawing to be a little upon the red, but it loses this little of its Colour according as it is boiled, and as it clarifies itself in the Ton; and it becomes perfectly white, especially when they have pressed the two first Cuts with much Dispatch; but principally when they have gathered the Grapes during the Dew, or in a shady Time. Although these Wines are white, they call them gray, because they are made only of black Grapes.

If the Year be hot, and the Wine of the third Cut has a Colour, it must be mingled not with that of the fore-

going, but with that of the fourth; and sometimes though very rarely with that of the fifth. They are not in so much Haste for these Cuts as for the first; they make an Interval of a good half Hour between the one and the other. The Wine that comes thence has more of Colour than this, which they call the *Partridges Eye*; or, the Wine of the Cut; it is a strong Wine, pleasant, fine, good for an Ordinary, but is better when it is old.

When the Wine of the fourth Cut is too deep, they do not mingle it with Wine of the first or second Cut, but they observe to mingle it with Wine of the fifth, sixth, or seventh Cut, which they call Wine of the Press, which is of a deep red, pretty hard, but fit for Household Drinking; but when they are not in haste they leave an Interval of an Hour and a Half between every one of the three last Cuts; as much to give Time to the Wine to strain insensibly, as to give the Pressers Time to sleep, or rest themselves, for the Fatigue is very great, they being obliged to carry it on Night and Day for about three Weeks. The Pressers of *Champaign* press the Grapes so hard, that after they have done, the Marc is as hard as a Stone; they put this Marc into old Casks with the Heads out, and they sell it to People who draw from it an *Aqua Vita*; of a very bad Taste, which they call *Aqua Vita of Aixne*; but it is good for a great many Purposes.

Those who have many Vineyards, also make two, three, or four first Pressings of the fine Wine, by choosing always the most delicate and ripest Grapes for their Firsts; these are always much superior the one to the other for Goodness and Price; so that if the Wine of one of the first Pressings sells for six hundred Livers a *Queue*, that of the second will not sell for above four hundred and fifty; and that of the third two hundred and fifty; although all the Vines are of one and the same Vineyard.

In every first Pressing there are ordinarily two Thirds of fine Wine, one half Third of Wine of the Cut, and one half Third of the Wine of the Press; thus one *Cuvée* of five or six Pieces of Wine, will consist of nine or ten of fine, three or four of the *Taille*, and two or three of the Press.

Of the common black Grapes, which remain after the first, second, or third *Cuvée*, they make one with those that are not very ripe, and which they call *Verderons*, they make of the Whole a Wine pretty high-coloured, which they sell to the Country People, or that serves for their *Domesticks*; they also leave these Grapes two whole Days in a great Tub, before they press them; to the End that the Wine may be the redder; and they mix all that comes from the different *Tailles* of this Vintage together.

The white Grapes don't come into this *Cuvée*; they leave them upon the Stock till toward *All Saints Day* or sometimes till toward the eighth or tenth of *November*, (at which Time the Mornings are cold) to make of it a *Vin Bourra*, as they call it, i. e. a new and sweet white Wine, that has not worked, which they sell while it is quite hot.

This Wine is still the better when the Grapes have been pinched by the white Frosts of *October* and *November*, or at least very cold Mornings. A little Rotteness in these Grapes does no Harm; you need only take

take Care to give the Wine Time to throw out the Filth by the Ferment, and purify.

This white Wine may be mixed with the Wine of the Taille, if you please when you have an Opportunity of selling it presently after it is boiled. This makes a very good Wine to drink, is pretty pale, and has a good Body.

All these fine Wines ought to be put into a new Cask, as also should those of the Taille; but the red Wines, the green, and those of the Press, may be put into an old Cask; but it ought to be a very good one.

You must never rub the Tons over with Brimstone; you should only wash them in common Water, a little while before they are filled, and give them Time to drain well: some Handfuls of Flowers or Peach Leaves may be mingled with the Water; and they pretend, that this will do the Wine good.

In *Champaign* they rarely put it in any thing but Pieces, *Carteaux* and *Cades*.

The River Measure is different from that of the Mountains: the Pieces of the Rivers contain about two hundred and ten *Paris* Pints (a *Paris* Pint is equal to an *English* Quart;) the *Carteau* a hundred and ten; the Pieces of the Mountains contain about two hundred and forty Pints, at the least two hundred and thirty *Paris* Measure; and the *Carteau* a hundred and fifteen, or a hundred and twenty.

They mark regularly with Chalk, every Piece, and every *Carteau*, to denote the first, second, or third *Cuvée*; the Wine of the Cutting of the Press, the white Wine, and the green; they also write the Name of the Vineyard from whence the Grapes came.

A few Years since, some private Persons in *Champaign* attempted to make Wine as red as that of *Burgundy*; and they succeeded pretty well as to the Colour: But in my Opinion these Sorts of Wines do not come up to those of *Burgundy*, in that they are not so soft, nor so agreeable to the Palate; nevertheless many Persons call for these Wines, and some esteem them the best.

And as those gray Wines are a little fallen, there has been made some Years past, a great deal of red *Champaign*. These Wines do well for *Flanders*, where they are frequently sold for those of *Burgundy*.

Of all these Wines, there is none better for Health, nor more agreeable to the Palate, than the gray Wine of *Champaign*, of the Colour of a Partridge's Eye, or the Wines of the two first Tailles of a first Pressing in pretty hot Years.

This Wine has a Body, a Tartness, a Headiness, a Balsamickness or Perfume, a Quickness and Delicateness, that exceeds all the most exquisite ones of *Burgundy*.

And that which should engage one to drink it, is its Lightness, which makes it strain and pass quicker through the Body than any other Wine in the Kingdom. It is a Mistake to be of Opinion, that the Wine of *Champaign* can give the Gout. I have scarce ever seen one gouty Person in this whole Province; and there need be no better Proof.

To make good red Wine in *Champaign*, the black Grapes ought to be gathered in the Heat of the Day; Care is to be taken to choose them well, and not to mingle

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with them the Grapes of the tall Vines, nor the green ones, or those that are partly rotten; to let them be two Days in one Tub, where the Liquor grows red by the Heat it contracts there: Some Hours before it is put into the Press, it ought to be trampled with the Feet, and the Juice to be mingled with the Marc; without this the Wine will not be of a sufficient Redness. If it be let stand more than two Days in the Tub, it will taste too much of the Stone. If it be mingled with the Wine of the Press, it will be too thick, too hard, and too unpleasant.

The Wine of the first Pressing being finished, and the Vessels marked, they set them in a Row in a Cellar or Court Yard, those who have a great deal of Wine and are good Economists, take great Care to gather the Scum that comes out of every Vessel, while the Wines ferment, by the Means of a Kind of Tin Funnel, made bending downwards, which lets the Scum fall into a wooden Bowl, which is placed between two Casks; they afterwards put these Scums into the Wines of the Press; but nevertheless there are but few that use this Piece of Economy.

They let these gray Wines stand to ferment in the Casks ten or twelve Days; because these Wines throw out their Ferment so much the more or less slowly, by how much they have more or less Warmth, or as the Years are more or less hot.

After the Wine has done fermenting, they stop up the Vessels at the great Bung Hole, and leave on the Foreside an Opening, about the Bigness of a French Farthing, by which one may put in his Finger; this they call *le Broqueteur*; and they stop this up ten or twelve Days after, with a wooden Peg about two Inches long, for the more readily taking it out, and putting it in.

All the while the Wines are fermenting, the Vessels are to be kept full, to give them an Opportunity of casting out all that is impure. In order for this, they must be filled up every two or three Days, within a Finger's Breadth of the Bung; after they have been bunged up, they must be filled up every eighth Day, at the little Hole, for the Space of two or three Weeks more; and after that once a Week for a Month or two, and after that once in every two Months as long as the Wine remains in the Vault, if it be there for Years.

When the Wines have not Body enough, or are too green, as it often happens in moist cold Years, and when they have too much Liquor, as in hot and dry Years; three Weeks after the Wines have been made, they must be rolled in the Casks five or six Turns to mix them well with the Lees; and this must be continued every eight Days for three or four Weeks. This mixing of the Lee with the Wine being repeated, will strengthen it, soften it, ripen it, render it more forward, and make it fit to drink in as short a Time as if it had been transported from one Place to another.

The Wines must be let stand in the Cellar till toward the tenth of April, when they carry them down into the Vault; but as soon as it begins to be cold in Autumn, they are to be carried up again into the Cellar; it is of Consequence to be observed, upon this Subject, that the Wines ought always to be in cool Places, and never to suffer Heat; and as the Vaults are cooler in Summer,

and warmer in Winter than the external Air, as soon as it begins to be hot, the Wines must be carried down, whether they be in Pieces, or in Bottles, into the Vaults; and when it begins to be cold, they must be carried up into the Cellar.

There has been nothing better invented and more useful, than the Manner of drawing off Wines. Certain Experience convinces, that it is the Lees that spoil Wines; and that they are never better, nor more lively, than when they have been well drawn off, whether you would bottle it, or keep it in the Pieces, it ought always to be drawn off, out of one Vessel into another, at least twice into another Vessel well washed, leaving the Lee in the former.

You should draw off the Wines the first Time towards the Middle of *December*; the second towards the Middle of *February*, and to fine them in *March* and *April*, eight Days or thereabouts before you bottle it. For every Piece of Wine, you must have of Isinglass, that is the whitest, of the Weight of a Crown of Gold, weighing two Deniers fifteen Grains, or sixty three Grains. They take so many Times the Weight of a Crown of Gold, as they have Pieces of Wine to draw off, they put this Quantity of Isinglass in one or two Pints of the same Wines, in a Bucket, for a Day or two, to give it Time to dissolve; others put it in a Glass, or a Pint of Water, according to the Quantity, in order to hasten its dissolving, which is always difficult to be done; some mix it in a Pint of Spirit of Wine, or excellent *Aqua Vita*. When the Isinglass is grown soft, they beat it well to divide, and distribute it; then, when the Parts begin to separate, they put in the Bucket or the Vessel, in which this Dissolution is made, so many Pints of Wine as they have Casks or Pieces to draw off; then they beat the Isinglass again and pass it through a Strainer, the Holes of which should be very small; they often pour in of the same Wine to dilute it well; and when there remains nothing in the Strainer, they pass all the Liquor over again through a Linen Cloth, and squeeze it very well; and afterwards they put one good Pint or less into each Cask, and half a Pint into each Carreau.

They stir the Wine in the Piece with a Stick about the Middle, without suffering the Stick to go any lower. It is sufficient to stir the Wine for the Space of three or four Minutes.

A certain private Person has newly contrived a quicker Method of dissolving this Isinglass; after it has been steeped one Day in Water, he melts it in a Skillet upon the Fire, and reduces it to a Ball, like a Bit of Paste, and afterwards puts it into the Wine where it distributes itself with less Difficulty. After what Manner soever it be dissolved, Care ought to be taken, not to put in too much Liquor, and not to put more than a proportionable Quantity of Water or Wine to that of Isinglass.

The Isinglass works itself ordinarily in two or three Days; though sometimes it does not clarify the Wine in six or eight; but nevertheless, you must wait till the Wine is clear before you change the Vessel. In the Winter the Seasons are oftentimes so improper for this, that there is a Necessity of putting Isinglass a second Time into the Piece; but then you must not put in

more than the Quantity before mentioned; but when it freezes, or the Weather is clear and cold, the Wine will clarify itself perfectly well, and in fewer Days; it has a Colour more lively and brilliant than when it is fined and drawn off in faint moist Weather.

As soon as the Wines are clear, they are to be drawn off, and the Vessels changed. Four or five new Casks are sufficient to draw off two or three hundred Pieces of Wine; for when they have emptied one Piece, they take out the Lee, and put it into the old Casks, wash it, and it serves to draw off another into it.

Nothing is more curious than their Contrivance in *Champaign*, to shift their Wines without displacing their Casks. They have a leathern Pipe like a Gut, four or five Feet long, and about six or seven Inches in Circumference, well sewed with a double Seam, that the Wine may not run through; there is at both Ends a Cannon or Pipe of Wood, about ten or twelve Inches long, and about six or seven in Circumference at one End, and about four at the other; the great End of each Pipe is set in a leathern Pipe, and well bound with strong Twine on the Outside, that the Wine may not run out; they take out the Bung that is at the Top of the Tun that they would fill, and drive the Wood of the Pipe in with a wooden Mallet, which they beat upon a Sort of Chin Cloth, that is fixed to each of these Pipes; which being fastened about two Inches within an Inch or less of the great End, and which loses itself insensibly in going towards the small End, they set a large Siphon of Metal below the Cask they would empty, and also put into this Siphon the small End of the other Pipe of Wood, which is fastened to the Leather Pipe, and afterwards open the Siphon, and without the Help of any Person, almost the Half of the full Vessel passes into the empty one by the Weight of the Liquor; and when it is come near the Level, and will run no longer, they have recourse to a Kind of Bellows, of a very particular Construction, to force the Wine from the Cask they would empty, to pass into that they would fill.

These Kinds of Bellows are about three Feet long, and a Foot and a Half broad; and are made and shaped in the common Manner to about four Inches of the small End; but from this Distance the Bellows have three or four Inches in Breadth. In the Inside of this Place, the Air passes only through one great Hole of an Inch Bore: Near this Hole, on the Side of the small End of the Bellows, there is a Piece of Leather, like a Tongue or Sucker of a Pump, which is fastened there, and lies close against the Side of the Hole and the Mouth, so that when the Bellows is lifted up to take in the Air, the Air that has passed once through this Hole, and has entered into the Cask, cannot return back into the Bellows, which takes not back a new Air, but by those Holes below to fill it again.

The End of the Bellows is different from that of others, being closely shut up with a Nozle of Wood of a Foot long, which is jointed in, glued, and very strongly fastened by good Pegs at the End of the Bellows, to conduct the Air downwards. The Nozle is round, and thick without, about nine or ten Inches in Circumference at the Top, and diminished insensibly towards the small End, that it may enter conveniently into.

into the Vessels by the Bung-hole, and also to shut it up so close, that the Air can neither get in nor out any Way.

This Nozle enters for this Purpose two Inches near the Level at the End of the Bellows, and is made in a half Round at the Top, that it may be beaten in with a wooden Mallet, and forced into the Cask; there is, about two Fingers Length below the upper End of this Nozle, a Hook or Brace of Iron of a Foot long, passing through an Iron Ring, which is fastened with Nails to the Nozle, in order by this Hook to fasten the Bellows to the Hoops of the Cask, without which the Force of the Air would drive the Bellows out again by the Bung-hole, and the Operation of emptying the broached Vessel would not be performed.

The Mechanism of these Bellows, thus described, is easy to be conceived. The Air enters by the Holes below in the common Manner; it advances toward the End, according to the Degree that the Bellows are pressed, there it meets with a Pipe that causes it to descend downwards; but to hinder it from rising up again, as it would do, when the Bellows were opened to give it a new Air; there is in this Space a Sucker or Tongue of Leather, which as has been said, is on the Inside of the Hole at about three or four Inches from the End of the Bellows, which shut up the Hole according as you would have it take in again a new Air; this new Air pushes still gently, in pressing the Bellows in the Pipe, because this Tongue opens according as it is forced by the Air; thus there continually enters a new Air into the Cask, without being able to get out, because it finds itself close stopp'd by the same Pipe that carries the Air into it, and the Tongue hinders it from getting out again.

The Force of this Air, which continually pushes in, pressing strongly upon the Bellows, presses equally the Superficies of the Wine over the whole Length of the Piece, without causing the least Agitation in the Wine; and the Force causes it to pass down in the Pipe of Leather, from thence into the other Cask that is to be filled, where it rises, because the Air is driven toward the Bung-hole, which is open.

The Bellows push all the Wine in the Cask to about ten or twelve Pints, or thereabouts; which is known when they perceive the Wine to hiss in the Siphon; at which Time they take from the two Casks, the two Pipes than have been forced into them, and which are joined together by the Leather Pipe, and nimbly stop up the Hole at the Bottom of the Piece with a Bung of Oak made round, a little sloping, and drive it with a Mallet; from the other Cask, that has been emptied, they pull out the Cannon or Pipe of Wood from the Fountain of Metal, and leave it to drain gently some Pints of clear Wine into a Vessel that receives it.

They observe attentively every Moment, in a clear Glass, if the Wine be neat; and when they perceive but the least Thickness, without waiting till it appears foul, they stop the Fountain, and take it away immediately, and turn out into a Bucket that little Wine that remains in the Piece: That clear Wine that has drained out of the Fountain, they put into the Cask that they have been filling; they use for this Purpose a Funnel of Tin, the Tail of which is about a Foot long,

to the End that the Wine that passes through it, may not cause any Agitation in that of the Piece; and that there may not any Filth pass into the Wine, there is, toward the Bottom of the Funnel, a Tin Plate pierced through with small Holes, which prevents any Thing gross from passing through into the Piece.

They put together into a separate Cask, all the Remainders of the empty Pieces; presently after they have emptied one, which they do in less than half an Hour, they wash it with a Bucket of Water, let it stand to drain some Moments, and then fill it with another that is to be drawn off.

After the Wine has been emptied out of one Vessel into another the first Time, they draw it off a second Time, at the Time we have before mentioned; sometimes they are obliged to do it a third Time, to give it a lively Colour, if it has it not already; but four Days before they change the Cask, they give it a Frizure, as they call it, and put in it one third Part of the ordinary Quantity of Isinglass.

The most experienced Persons shift their fine Wines out of one Vessel into another, as often as they change its Place, as well when they carry it down into the Vault, as up into the Cellar, according to the different Seasons: I have known when, in four Years Time, they have drawn it off twelve or thirteen Times; and they pretend, that this preserves and sustains the Wine; and that it has been the finer, and more delicate.

Their Opinion is, that the Wine is continually forming a fine Lee, which gives it the Colour; and that to preserve it of a good White, it must be often shifted out of one Vessel into another, if it be not put into Bottles; and that there is no Reason to fear, that the Wine will be weakened by this Means, because the oftener it is removed, the oftener you give it new Vigour, and the oftener it is drawn off, the more lively and and brilliant is the Colour.

And although I have said they should not brimstone their Casks, they do not fail to use a Match of Brimstone the first Time they change the Vessels; they mingle a Piece of thick Linen Cloth in the melted Brimstone, and they cut off a Bit for each Cask of fine Wine about the Bigness of one's little Finger, and one as big again for every Piece of common Wine; they light it, and put it under the Bung of the Piece they empty, before they have Recourse to the Bellows; according as the Wine descends, it draws along with it a small Scent of the Brimstone, which is not very strong so as to make it perceivable, and that only leaves what will give it a Liveliness of Colour; the same may be done the second Time, when they change the Cask, if it has not taken the Scent the first Time, otherwise it ought to be drawn off the second Time without a Match, to cause it to lose the Scent of the Brimstone, which it ought never to have.

The Wines that are thus clear and fine, keep very well in the Cask for two or three Years, and hold their Goodness in the Vaults and Cellars; but especially the Mountain Wines that have a good Body; those of the River lose their Quality in Wood, and they ought to be drank in the first and second Year, or else they must be put into Bottles. This Wine will keep very well four, five, or six Years in Glass Bottles.

The Use of round Bottles is very common in *Champaign*; they having Plenty of Wood in the Province, have there set up very good Glass Houses, which they seldom make use of but in making these Bottles, which are about six Inches high, and four or five in the Neck. These Bottles contain ordinarily a *Paris Pint*, or half a Glass less. They sell them commonly for twelve or fifteen Francs a hundred. They have a certain Quantity in every House. Before they enter upon a Piece of Wine to drink, they put it into Bottles well washed and drained, in order to have the Wine of one Piece equally good.

When they have a mind to draw off a Piece of Wine into Bottles, they put a little Siphon of Metal into the Cask, which is bent downwards, to strain it into the Bottle; under which there is a Tub or Bucket to catch the Wine that shall run over. They stop up every Bottle carefully with a good well chosen Cork that is not Worm eaten, but that is solid and close. These Sorts of fine Corks cost fifty or sixty Sols a Hundred. There cannot be too much Care taken in the choosing Corks, lest the Wine spoil in some of the Bottles, when the Corks are defective; therefore great Care should be taken in the choosing them, when you would draw off fine Wines into Bottles, whether it be for keeping, or to be sent Abroad.

When Bottles are used that have been made use of before, they should be washed with leaden Shor, and a little Water to fetch out the Filth that shall remain on the Bottom of the Bottles; but it is much better in the room of them, to use small Nails, because they perfectly take off all that which sticks to the Glass.

When all the Bottles that suffice to empty one Cask are filled, they tie the Mouth of the Bottle over to the Neck, with a strong Packthread; and if it be a fine Wine, they commonly seal it with Spanish Wax, that the Wine may not be changed, nor the Bottles by the Domesticks; and some Persons have their Coats of Arms made on the Bottles, which does not enhance the Price above thirty Sols *per Cent*.

When all the Bottles are well stopped, tied down, and sealed, they ought to be set in a Vault or Cellar, upon Sand two or three Fingers Depth, and laid Side-ways leaning against one another; when they are set upright, they form a white Flower upon the Wine at the Top, in the small empty Space that is between the Top of the Mouth of the Bottle and the Wine; for the Bottles ought never to be filled up to the Top; but there must be left a small empty Space of about half an Inch, between the Wine and the End of the Cork.

If this was not done, the Wine would set a working in the different Seasons of the Year, and break a great Number of Bottles; and it does, notwithstanding, break a great many, in spite of all the Caution that can be taken, and more especially when the Wine has a great deal of Heat, or is a little tart.

In some Years the Wine grows rosy in the Bottles even in the Vaults, so as to rope when it is poured out as if it had Oil; so that it cannot be drank. This is a Malady that seizes the Wine that has stood several Months without being removed from one Place to another. If it be set in the Air, it will lose more of its Rosiness than

it will if left in the Vault. It will recover itself, if set in a very airy Granary, better than it will oftentimes do in six Months in a Vault.

When one is obliged to drink a rosy Wine, if he shake the Bottle strongly for the Space of half a Quarter of an Hour, and then uncork it immediately after he has done shaking it, the Bottle being a little inclined on the Side, will cast out presently half a Glass of Froth or Scum, and the rest of the Wine will be drinkable, whereas otherwise it would not be so.

For about forty Years last past, the Taste of the *French* has been determined for a frothy Wine; and this they used to love, as one may say, even to Distraction. They have begun a little to come off from that for some Years past. Their Sentiments are much divided as to the Opinion of this Kind of Wine; some believe that it proceeds from the Force of the Drugs they put in it which makes it froth so strongly; others attribute it to the Tartness of the Wines, because the greatest Part that do froth are extremely tart; others attribute this Effect to the Moon, according to the Times in which these Wines are bottled.

It is true, there are a great many Wine Merchants, who, seeing the great Fondness that there is for their frothy Wines, oftentimes put in Alum, Spirit of Wine, and Pigeons Dung, and a great many other Drugs, to make it froth extremely, but it is certain, by Experience, that the Wine froths when it is any Time bottled from the Vintage to the Month of *May*. There are some who pretend that the nearer the Vintage Time the Wine is produced, when it is bottled, the more it froths. Many do not agree to this Opinion, but nothing is more certain than that there is no Time in which the Wine froths more, than about the End of the second Quarter of the Month of *March*, and this always happens toward the Holy Week. There does not need any Artifice at all, one may always be sure to have Wine perfectly frothy, when it is bottled from the tenth to the fourteenth of the Month of *March*; of this there is such reiterated Experience, that it cannot be doubted.

It is good to know that the Wine does not froth presently after it is put in Bottles; it must be at least six Weeks, and sometimes six Months, before it froths well. If it is to be transported, you must give it near a Month of the Vault, especially in the Summer, to recover its Remove.

But as Wines, especially the Mountain Wines, are not ordinarily bottled in the Holy Week, because they are then too green, or have too much Hardiness, especially if the Year has been cold and moist, or too much Liquor expressed, if the Year has been hot, the most sure and advantageous Way to have exquisite Wine, that is perfectly frothy, is not to bottle it till the Rise of the Sap of *August*. It is certain, by Experience, that it froths excessively when it is bottled from the tenth to the fourteenth of *August*, and as it will then have lost the Tartness or Greenness of its Liquor, one may be assured in Bottles to have the ripest and most frothy Wine.

There has been another Experiment tried, which is, not to bottle the Mountain Wine till the Holy Week of the second Year, that is, eighteen Months after the Vintage.

Vintage, and it has been found that it froths sufficiently, but less by half than that which has been bottled in the Rising of the Sap of *March* the Year before.

It is not believed that the River Wine, which has a less body than that of the Mountains, can froth so much in the second Year. When one would have Wine that will not froth at all, it should be bottled in *October* or *November*, the Year after the Vintage; if it be bottled in *June* or *July*, it will froth slightly, though but a little, if any Thing at all.

To find in the Wine of *Champaign* all the Merit that it ought to have, it should be taken out of the Vault not above half a Quarter of an Hour before it is drank, and it must be put into a Bucket, with two or three Pounds of Ice; the Cork should be opened, and put in again lightly, which, if it be not done, the Wine will break the Bottle, or will not grow cool, if it were not unstopped, and it would evaporate itself, if it remained quite open. When the Bottle has been half a Quarter of an Hour in this Ice, it must be taken out, because the Ice would otherwise chill it too much, and make it lose its Briskness. This Wine will be excellently good, and of a delicious Flavour, when it has been a little affected by the Ice, but great Care must be taken that it may not be either too much or too little.

As these Wines, especially those of the same Year, work continually in the Vaults and Cellars, and still more in Bottles than in Pieces, according to the different Seasons, and the divers Impressions of the Air, it ought not to be surprising, if the same Wine, especially the new, oftentimes appears different in Taste: We find a Wine potable in *January* and *February*, which will seem hard in *March* and *April*, because of the Rising of the Sap, which agitates it more; the same Wine in *June* and *July* will appear entirely soft, and in *August* and *September* we shall find it hard again, which one shall not be able to perceive any Thing of during the preceding Months, because the Rising of the Sap in *August* will put the Parts in a great Motion. This Effect Motion will have on the River Wines of the Year, but oftentimes the Wines of two Years from the Mountains will appear more mellow, more or less exquisite, more or less forward, according to the different Motions it has received by the different Impressions of the Air, which will vary more sensibly in the different Seasons of the Year.

There ought to be very great Attention to keep the Wine continually in cool Places, for, as nothing does it more Hurt than Heat, it is of the greatest Importance to have good Cellars, and excellent Vaults. No Part of the World has so good Vaults as those in *Champaign*, which is the Reason it is so difficult to find any where else so good Wines as those of this Province.

Those who would lay up a Stock of Wine, and are able to keep it two or three Year, or whose Business it is to send it into other far distant Provinces, or to foreign Countries, ought to choose the Mountain Wine; for, as it has more Body, it will better bear Transportation than those of the River, and, besides, the *English*, the *Flemings*, the *Dutch*, the *Danes*, and the *Swedes*, desire these strong Wines that can bear the Transportation, and hold good for two or three Years, which the River Wines will not do.

The most noble River Wines are those of *Avoillers*, *Ay*, *Epernay*, *Pierry*, *Camieres*; those of the Mountain are, of *Sillery*, *Verzenay*, *Taissy*, *Milly*, add above all those of *St. Thierry* have the most Reputation. The last has for a long Time had the greatest Name, and been the most called for, and one may venture to say, that it comes nothing behind the best Wines of *Champaign*.

By all the Observations which have been made on what is practised in this Province, in cultivating and ordering the Vines, and in fining off the Wines, in bottling and carrying them up and down into Cellars and Vaults, and from Vaults to Cellars, it will be found that even Persons of good Taste, in the Provinces of *Burgundy*, *Berry*, *Languedoc*, and *Provence*, who are yet very curious and delicate in making Wines, especially for their own Tables, know not so well how to bring it to Perfection, as those who are accustomed to make it in this Province, for though their Wines have not the Tartness of those of *Champaign*, yet they are able to make them more clear, fine, and light. They might therefore try if they would not be preserved better in drawing them off from the Lee, than in letting them lie on it, according to their usual Custom, which some are of Opinion is absolutely wrong. They should choose and pick, in the Fresh of the Morning, their finest black Grapes, and those whose Berries adhere the least together, because they are the ripest, and they should observe to leave as little Stalk to them as may be, and, with regard to Pressing, in which they are usually faulty, they should immediately, as soon as carried, trample every Load of Grapes successively as they are brought in, and collecting the first, must put it in new Casks of a less Size, and when they have finished treading the Remainder of each Carriage, they should put them into the common Vat, but let them not remain there so many Days as they are generally used to do, that so their common Wines may be thinner, and less strong. By this Management they might make four, five, or six Pieces of fine Wine, more or less, according as they shall find it good, and then they should take the same Care, as has been said those of *Champaign* do; and if they would be content now with a less Produce, they would have a far greater Quantity the following Years, and would be continually bringing it to a still greater Perfection as they improved more and more in Experience. In those Countries, where they can conveniently have Presses, they should make them.

Their Wines would be more delicate, more light, and less coloured, by this Attention, and, with half the fining, would be better for Transportation, in drawing them from the Lee, and especially if they are put into Bottles.

All these Observations, which we have made, will be of great Use to those Persons who would improve their Wines, or desire to drink delicious Liquor, but such Persons must remember that they ought, above all this, to study to have good Vaults, and those which are coolest in the Summer, and warmest in the Winter are ever the best.

It may seem to many Persons in this Country that we have been too prolix in the Account we have given, but these Observations are not designed for those who are acquainted with the Practice already, but for such Persons

sions

sons as are wholly ignorant of these Things, and who are so far from taking any Pains in the ordering their Wines, that it is a Pain to them to conceive the greatest Part of those Things which I have taken Notice of to be necessary, and who cannot be persuaded, but that they observed every Thing requisite to the proper Management of Wines as exactly as those of *Champaign* do.

They practise nothing in *Champaign*, which may not be perfectly imitated in other Places, the drawing off the Wines, the Manner of fining them, and putting them in Bottles, &c. all is equally possible, and also easy. Many Persons might enrich themselves, if they would set themselves about it, with the Help of these Observations, and of those they might make themselves, to bring their Wines to Perfection, and instead of selling them for one or two Sols per Pot, as they ordinarily do, they might sell them for upwards of eight or ten. They would have the Satisfaction of augmenting their Income, and see their Wines sought after, and they would be able to sell them not only at Home, but also to transport them into foreign Countries, because their Situation is more favourable to send them by Sea than that of the *Champaignois*, who are obliged to transport theirs upon Waggon, and by Rivers, into *Germany*, and the farthest Parts of the North.

Perhaps some Criticks will object the Difference of Climates, which will not permit the same Culture of the same Plants, which, by their different Qualities, require particular Managements. This Way of reasoning might have Place, if I had pretended to speak to a People who studied to order their Vines with great Attention, and to give them a Fineness, but I have it chiefly in View, as I have had in collecting these different Observations, to instruct those People who are entirely ignorant of the Method used in those Countries where they are accustomed to make excellent Wines, as well by Reason of the Goodness of the Lands, and the Warmth of the Climate, as by the industry of those who inhabit them.

In *Champaign*, where their Grapes do not ripen but with Difficulty, because their Country is cold, they make pale and white Wines, the Wines truly gray, which are a little coloured, and the Velvet Wines: Why cannot they make all these Sorts of Wines in *Berry*, in *Burgundy*, in *Languedoc*, in *Provence*, &c.

The Warmth of the Climate will not permit Wines to be made perfectly white with black Grapes; they will have a little Colour, and they will not thence be less exquisite than those they have made these fifty Years in *Champaign*, and in the main are better in Taste, and better for Health, than those Wines that are perfectly white, which cannot be used but after Dinner.

A DISSERTATION on the Situation of *Burgundy*, and the Wines that it produces. By Mr. Arnoux.

The Town of *Beaune* is the Center of *Upper Burgundy*; it is situated in a Territory the most fertile and serene in *France*; it is all round encompassed with Cities, among which is *Autun* the ancient Capital of the *Gauls*, *Dijon* the Capital of the Dutchy of *Bourgogne*, *Nuis*, *St. Jean de Laune*, *Verdun*, *Seuree* or *Bellegarde*, *Chalons* on the *Saone*, *Arnay le Duc*, *Sanlieu*, *Flavigny*, and *Semeur*. *Beaune* is placed almost in the Middle of these Towns, which are not above eight, nine, twelve,

twenty-one, or twenty-four Miles at the farthest, to be, as it were, a Nurse to them all, in distributing plentifully amongst them the Liquors which it produces.

All the Learned are agreed unanimously that it is the ancient *Bibraëte*, of which mention is made in *Cæsar's Commentaries*.

Cæsar not having above two Days Provision for his Army, and being not above thirteen Miles at the most from *Bibraëte*, the biggest, richest, and most fertile City of the *Eduans*, thought proper to march thither to procure Provision for his Troops, and that is the Reason he quitted his Way to *Switzerland*, and came to *Bibraëte*. *Com. Cæs. Lib. de Bel. Gal.*

But to return to the Town of *Beaune*: This Town cannot pretend to glory in these ancient Remains of Antiquity, which the Air consumes, and Time reduces to Dust; it only glories in its good Wines, which every Year bring to the Citizens new Riches. However, it has been within an Age past a strong Place, and is still surrounded with a large Ditch, which runs into the River *Burgoise*; this takes its source at about half a Mile from one of its Hills; it is also encompassed with a Rampart flanked with some Towers, and five great Bastions. The Ditch, which encompasses the Town, is above a Mile and a Half in Circumference; the Citizens there enjoy almost continually a pure Air, and a clear Sky, being equally about a hundred Leagues off from the *Mediterranean* and the Ocean. The Waters are, as one may say, in suspense, when it is about to determine its Course. There is also a great Body of Water in its Neighbourhood, which is seen in all the Charts of *France* under the Name of the Pond of long Extent. It is the Opinion of some Persons that this partakes of the Waters of both Seas.

This Town can count fourteen or fifteen thousand Inhabitants, of which the fourth Part are employed in cultivating their Vineyards, and another fourth Part in carelessly exercising some Professions they are ignorant of and the other Half in enjoying the Pleasure of a soft, idle, and delicious Life. The Gout and Sicknefs are banished from these Walls. From these Hills, that produce such excellent Wines, issue out Fountains of Ice, and little Rivers as clear as melted Chrystal. These Waters issue out from the Earth in a Line opposite to the Perpendicular, bubbling up, and pushing out of the Earth on high Globes of Rock Chrystal, which keep their spherical Figure, till they are at the Superficies.

The Hills of *Upper Burgundy*, which produce the Wine, the only Wine which one can or ought to call *Burgundy* Wine, do not extend farther than from *Dijon* to *Chalons*, upon the *Saone*, yet we ought not reckon these Vineyards to be in Perfection but from *Chambertin* to *Chagny*, about twenty four Miles in Extent, for the Vines at *Dijon* and *Chalons* do not enjoy those Climates which produce those Wines that are fit to be transported into *Great Britain*, the Circles of the *Empire*, and the *Low Countries*, as those which are confined within the Limits, that I shall mention as exactly as I can, without being apprehensive of passing under any Censure upon this Account.

The same Row of Hills in the same Situation, and having the same Aspect of the Sun, extends itself almost as far as *Lyons*, and all those little Mountains are wholly

wholly covered with Vines, but the Lands are less fine, and less light at *Chalons*, heavier at *Tornus*, and coarser at *Mécon*. This alters the Form of the Productions of these little Hillocks, which, notwithstanding they have the same Arrangement, and the same Situation, produce so different Liquors.

All those little Valleys are linked one to the other to the East Aspect of the Sun, and form the Figure of an unbent Bow, and have opposite to them a Row of Mountains of the like Figure but a great deal higher, which appear or seem to join them, although they may be fifteen, twenty, thirty, and some sixty Leagues off, and, forming an oval Figure, contribute to make the finest Prospect in the World. This Oval must have more than one hundred and fifty Leagues in Circumference.

From these Hills of *Beaune* all the opposite Mountains are seen, and they are those of *Switzerland*, the *Franche Comté*, and Mount *Jura*, of which *Cæsar* speaks, at this Time called Mount *St. Claude*, those of *Savoy*; beyond these is a frightful Void, and of an immense Length; and Mount *St. Bernard* rises into the Clouds, always covered with Snow in the most violent Heats of the Dog Days, and although it be sixtyfive Leagues off from *Beaune*, it is seen distinctly without the Help of any Glass.

This perfect Oval forms a Plain of the same Figure, to which these Mountains, that environ it, seem to serve for Walls and Ramparts; this vast Plain is watered by the *Saone*, which *Cæsar* calls *Arar*, and by the *Doux*, which he calls *Alduodubis* in his Commentaries, which has its Source at the Foot of Mount *Jura*, passes by *Besançon*, and by *Dole*, and casts itself into the *Saone* at *Verdun*; there are also a thousand pretty Rivers and Streams, which after many Turnings and Windings, lose themselves in the *Saone*.

This great Plain, which is at the Center of the Continent, is so even, that the *Saone*, which runs through it, by its gentle Course deceives the Eyes of those who look upon it, it being difficult to discover which Way its Stream glides. *Cæsar* himself was surpris'd at it, as he declares in *Lib. I.* of his Commentaries.

The *Saone* is a River that separates the *Eduani* and *Sequani*, i. e. *Bourgogne* from the *Franche Comté*, and flows into the *Rhone* with an incredible Gentleness, that one cannot distinguish by the Eye which Way its Waters run.

This is a vast Plain, so fertile and even, that all the Kings of *France* went to assemble their Armies there, when they have a Mind to shew the Encampment of all their Troops to the Queens, and the Ladies of the Court.

Behind the first Row of Hills that produce so good Wines, there is nothing to be found but Hills and Valleys; the Hills that are the least distant are all planted with Vineyards, and these Situations are called *Backward Hills*. In the hottest Years, when the Rains are less frequent, the Grapes make a very good Wine, but it never has the Perfume of the Wines produced by the forward Hills.

The Plain of this Oval is in Part covered with Wines, fertile in all Sorts of Grain embellished with vast Meadows, where a thousand Streams play in their different

Windings, adorned with fine Forests inhabited with Stag, wild Boars, and, above all, with Roe Bucks, which are there very delicious, and agreeably furnish the Gentry with the Divertisements of Hunting.

A great Part of these Lands are planted with Trees in Form of Orchards, which produce without Culture excellent Fruit, which when they have been once grafted, it is enough, the Sun and the Earth do the rest. The Peach Trees, which throughout sympathize with the Vine, there make upon the Banks a fair Forest, and the Branches of these Trees grow thinly, and the Leaves being narrow, they do not hinder the Sun from darting its Rays on the Grapes to ripen them; the Peaches which they produce are of a Figure and a Colour that would not anticipate one in their Favour, nevertheless, when one has tasted of them, it seems to the Palate to be a Fruit made of Wine and Sugar.

It ought not to be forgotten, that when the Sun is risen above the Mountains of *Savoy*, there is a Prospect of the Hills of *Burgundy*, where it shines during the whole Day, and in setting behind the Hills of *Beaune*, darts its Rays upon the Mountains of the *Franche Comté*, which lie opposite to it, and there, in going down, ripens very excellent Wines, as those of *Arlois*, which are so well known throughout *Europe* for their excellent Qualities.

Before I begin to speak of the Quality of the Wines of *Beaune*, it will be proper to give an Account of the Manner in which they there cultivate their Vineyards, and make their Wines, for although *Burgundy*, by the Goodness of its Soil, and its Exposure to the rising Sun, does naturally produce delicious Grapes, yet the Manner of cultivating their Vines, and of making their Wine, contributes much to its Goodness.

During the Winter the *Vignerons* employ themselves in examining the Earth of their Vineyards, and by some Loads of Earth conveniently laid, which they carry thither, they fatten the Places which appear to be worn out, and seem to require Assistance to produce the better Grapes, which happens, however but very seldom. Then they take Notice of those Places which are void of Vines, whether they are declining by Age, or do not appear to promise Grapes, and they make large Trenches from a Foot and a Half to two Feet and a Half long, and a Foot deep. If the Earth is too lean, they put in half a Foot of good Earth, and sometimes a little old well rotted Dung, but, generally speaking, they put in nothing at all, and, taking one or two Branches of a neighbouring Vine, they bend them down into each Trench, cover them afterwards entirely with the proper Earth of the Vineyard, in such Manner, that you may see the two Ends of the Vine Branch bent come out of the Earth; to wit, that by which it holds by the Vine, and that of the other End, which come out of the Trench, where they have bent it, about three or four Fingers in Length. They make a great many of these Trenches in a Vineyard that they may be always supplied with young Vines that will produce a good Plenty of Grapes, for it ought to be observed that this Vine Branch bent down in a Semicircle in this Trench, which is a Shoot of the preceding Year, having its Pores open, takes in two Sorts of Nourishment, the one from the Vine to which it is united, and the other

other from the Trench in which it has been bent, in which it takes Root. These are what they call *Provins* or Layers.

They produce Abundance of Grapes, which are commonly first ripe, well nourished, large, and well relished, but their Juice is not so good as that of the Grapes of the old Vine. The Physical Reason is, that the nourishing Juice has not been so well filtered in passing through those Layers, whose Pores are very open, as in passing through the Pores of the old Vine, whose Pores are more close, and less spongy.

They dig with a Spade the Vineyard ordinarily three Times a Year, that is about the End of *February*, or the Beginning of *March*, when they give it the first Time, and it is in the Month of *March*, or about the End of *February*, that they prune their Vineyards.

And in this consists the Address and Skill of the *Vignerons*, for he ought to make a right Choice of those fine Branches that he is to prune, and of the Joint where he is to cut the Shoot, as well as that which he is to cut entirely off.

Observe what I have seen practised by the *Vignerons*. Of four or five Branches, the Shoots of a Year, belonging to the same Stock or Vine, they leave but one or two of the best made, which they cut off to the third or fourth Joint at most.

The same they practise on the Vines of the Hills, which produce the finest Wines, for as to the Vines on the Backside, or of the Plain, they cut them to the second or to the first Knot, for these Vines put forth too many Shoots; but, as this is an Art of which it will be difficult to give the Precepts, because the Manner of cutting the Vines is different, according to the Ground, the Nature of the Vine, its Quality, Exposition and Nearness to the Sun, I will go on with my Dissertation.

When the Vine is cut, they place Stakes or Vine Props, to which, at the Height of half a Foot above the Earth, they bind the Branches of the Vines in a horizontal Manner, and afterwards when the Buds or Eyes are opened, and have put forth Shoots in Length about a Foot and a Half, they bind them to the Props which sustain the Branches which produce the Fruit. These Props are of the Height of three or four Feet, and the thickness of two Inches; they are struck into the Ground without an Arrangement or Order, at the Distance of a Foot more or less one from the other, according as the Vineyard is more or less furnished with Vines.

Nevertheless, the End of the Shoots which are there bound horizontally, as one may say, look all to the same Side.

This Manner of placing the Props without Order is of great Consequence, that is, that one Branch may not be covered by the Shadow of another but as little Time as may be, and that if the Rot comes to some Grapes, they may not be able to communicate it to others. This manner is contrary to that of the *English*, who plant their Vines in Rows, and thence it is that the one hinders the Sun from shining upon the other, and of consequence, that hinders the ripening of the Grapes.

The most dangerous Season for the Vine is when there has been a North Wind, which has caused a small

white Frost. If the Sun comes to appear in the Morning, it dries and burns all the young Leaves, the Buds, and the Grapes, after the same Manner as if Fire had been there.

It is for this Reason that the Friars in *Burgundy* have Recourse to Prayers at this Time more than at any other, and that after calm and cold Nights, the superstitious Peasants run to the Churches, and ring the Bells with all their Might. Whether it be that they imagine that God has any Regard to this Work of Religion, or that the Agitation that they make in the Air may, in some Sort, warm the Air again, or change the Wind, but, however it be, they do at this Time ring the Bells with such Violence, that there is no sleeping; during which Times the Priests and Monks are busy in reading in the Churches the Passion of our Saviour, according to the Gospel of St. *John*, and for this Occupation they make a Collection among all the Presses at the Time when they make their Wine, and every *Vignerons* is obliged to give them a certain Quantity of Wine, and that by an Order of Parliament at *Dijon*.

When the Vineyard has escaped the Danger of the Frost, they dig it again, and this they call *Biner*, or the digging of the Vineyard the second Time; after which the Grapes soon begin to flower, which spread a sweet Savour all over the Country, and is the Time when all the Wines which are in the Tons in the Vaults, though never so deep, if they are upon their Lee, without having been drawn off or clarified, work, ferment, grow thick, and cover their Superficies with small white Flowers like Snow; a Thing difficult to be explained by Philosophers, in this Question in Physics, when they demand, *Utrum detur actio in distans?*

It must be observed that all the Vines of the good Hills of *Burgundy* pass from their Flowers to the Grape, that is to say, that the Flower of the Grapes changes into Berries in the Space of twenty four Hours, and if, during that Time, there happens a cold Fog, or a cold Rain, their Flowers instead of turning to Grape, fall, and the second Peril is no less dangerous than the first, when that happens. The Term, that they make Use of to express it, is to say the Vines are *Couler*, i. e. drop their Grapes.

At the End of *June*, or the Beginning of *July*, is the Time when the Vine changes from the Flower to Berries, after which the Vine has nothing to fear but the Hail, or a too great Drought. As soon as ever the *Vignerons* see the least Cloud to rise upon the Horizon, and the Air seem to threaten the least Storm, they have Recourse to their Priests, their Bells, and their *Pater noster*, which they would not recite, but for fear that the People would rise against them, if Hail should happen during that Time, that they were not at their Prayers.

The Reason that they are so much afraid of the Hail in *Burgundy* is, because the Vintage is all the Dependence of the Inhabitants, and that the Grapes, being smitten by this Scourge, give to the Wine, in some Measure, the same Taste, and the same Scent, which Lightning spreads on the Places where it falls, a Scent which is impossible to take away.

As to Drought it is not only to the Bells, or to the Priests that they have Recourse, but to one or two Stone

Stone Busts in two Villages about seven or eight Miles from the Town of *Beaune*, one of which Idols is known and worshipped under the Name of *St. Revereen*, and the other under the Name of *St. Marguerite*; they assemble together, and go in Procession to search in Triumph for this Stone, which they carry solemnly to a Church in the Town. All the Priests go in Procession, followed by the Parishioners of which they are *Curés*, and they offer their Incense and Prayers, rub their Books and their Chaplets against these extraordinary Figures, and oftentimes it happens to rain in this Conjunction, which does not a little contribute to keep up this Superstition in the People.

It is in *July* that they dig the Vineyard the third Time; this they call Thirthing. There are many Years in which they dig their Vineyards the fourth Time, and this is in the Month of *August* that they give it this fourth Digging, but they take great Care to dig the fourth Time when the Season is not too hot or dry, or, on the contrary, to defend the Grapes from the Heat of the Sun, they let the Grass grow in the Vineyards; this shades them, and hinders the Vapours of the Earth from burning the Grape.

A Month before the Vintage the Magistrates of *Beaune*, accompanied with many experienced Judges, and Persons of Probity, make three Visits to examine the Maturity of the Grapes, and at this third Visit and Examination they decide the Day of gathering the Vintage. No private Person dares to cut in his own Vineyard one single Basket of Grapes, upon Pain of Confiscation, and a considerable Fine; for if it were permitted to each particular Person to gather his Vintage according to his own Fancy, and his particular Opinion, and according to his Taste, there would be Wines too green sent abroad into other Countries, to the Dishonour of *Burgundy*, and to the Discredit of the Wines.

And also for fear that any Vapour should spread itself over the Vineyards, for fifteen Days before the Vintage, they take Care not to burn any Straw or Hemp Stalks in the Streets, lest the Smoke should give any bad Taste to the Grapes.

The Grapes being come to Maturity, the Magistrates give Notice a few Days before by a Trumpet to the Town, of the Time they have appointed and fixed for gathering the Vintage. *Volnet* begins first, a Day before *Pomard*, and afterwards all the little Hills gather their Vintage indifferently, for after the Town of *Beaune* has gathered their Vintage one single Day, the Vintage is opened for all the other Vineyards on the Side of *Burgundy*. It will be seen by and by why *Beaune* decides the Vintage of *Volnet* and *Pomard*. It will scarce be believed that all the Hills from *Chamberry* to *Chagny* should have their Vintage gathered in the Space of four or five Days, and also it is scarce credible, what a vast Number of Mountaineers from every Part come to labour in this Work.

They gather the Vintage perhaps (and my Conjecture is founded upon more than twenty-five Vintages, which I have seen made) more than two thousand (*Queues*) Tons of Wine upon these Hills, and the *Queue*, which is always divided into two Punctions, some times into four *Feuilletes*, and very rarely into eight *Cabillons*, contains five hundred Bottles of Wine, or to

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speak more exactly, four hundred and forty Pints *Paris* Measure.

It will be proper here to observe that in this great Extent the Vineyards produce but one Kind of Grapes, which they call *Noirons*; the Berries of which are black when they are ripe, and quite round. The Plain and the Backsides produce only a Sort of Grape, of which the Berries are bigger, and a little longer, which they call *Gamet*.

Those who would make excellent Wines, never cut the Grapes till after the Sun has dried up the Dew which has fallen in the Night Time; for this Moistness although it be but a rarefied Air, cools the Grapes, which, being cast into the first Vat, suspends, and oftentimes hinders, the Fermentation. Those covetous Persons who are more desirous of the Quantity than the Quality, use not these Precautions; but on the other Hand, those who would make excellent Wines, do not put into the same Vat any Grapes but those of the same Vine; but almost all the particular Persons who have a hundred Perches of Vineyard in different Cantons, mingle their Grapes the one with the other, because the strong helps the weak, and the good mends that which is worse, and in a Word, that they may make the Vat the larger. The Choice of the Cantons from whence the Wine is produced, depends on the Discernment that the Commissioners ought to have, when they taste the Wines they would send into other Countries; and that which the *English* Gentlemen ought to recommend to their Commissioners who furnish them with Wine for their drinking.

The Grapes being put into the fermenting Vat, throw up a great Scum, which by the Agitation make to the Ears a continual Trembling, a little clattering and spread abroad such a Scent, that is capable of intoxicating; and perfumes the Houses, and spreads itself all over the Town.

They do not let the Grapes lie still in the Vat, they stir them and disturb them. The Labourers trample them briskly three different Times, for the Space of two Hours each Time. And to give a clear Idea of the Manner of treating the Grapes in the Vat, as soon as they begin to ferment in the Vat, they tread them for two Hours at the least; six Hours after they tread them again for as long Time as before; and six Hours after that they tread them the third Time; and after that they put them under the Press.

It must be observed, that the Grapes of *Volnet*, of *Pomard*, and *Beaune*, being fermented in the Vat in the Field, cannot be let stand above twelve or eighteen Hours there; those of *Pomard* a little less; those of *Beaune* so long, or a little longer according to the Delicateness of the Ground, and the Heat of the Grapes; for there are Vineyards behind the Hills of *Beaune*, the Grapes of which do not begin to ferment till after they have been eight or ten Days in the Vat. Note farther That to give a Colour to the Wine, depends on the Time, more or less that it is left in the Vat. As for Example, the Wines of *Volnet* have the Colour of a Partridge's Eye. This is the Cause they do not leave the Grapes of this Ground but a very little Time in the Vat; and if they should let them be there but a little longer than they ought, the Wine would lose its De-

licacy.

licacy, and would taste of the Grape Stones, or the Stalks.

After the Grapes have been, according to their Quality, more or less Time in the Vat, and have been trodden, there swims over a Liquor they call *Surmou*. They have Casks of sixscore Pots, or half Hogsheds of sixty Pots, ranged upon Chantiers, or Stillings for Hogsheds, into which, by equal Portions, they cast in this first Running; and afterwards they put the Grapes that remain on the Press, when the *Surmou* has been drawn off; and when these have been well pressed, all the Liquor that comes from them is equally distributed into those Pieces where they have already put the unpressed Wine: and then they open the Press, and afterwards with a Planer, they cut the pressed Marc three or four Fingers Thickness round about, and put the Parings in the Middle, and afterwards press it again; then they cut it again, and press it a third Time; and all the Liquors of these different Pressings are equally distributed into the Tons till they are full.

Upon which it ought to be observed, that the unpressed Wine is the most light, delicate, and least coloured Liquor; that which comes off the first Cut of the Press the most racy and that which comes from the second and third Cut of the Press, is more hard, red, and green, so that these three Sorts of Qualities being united, make a Wine much better, more durable, and finer coloured.

All these Pieces or Tons being full, they leave the Bung open, and the Wine, in a Fury, shakes and agitates itself, in such a Manner, that it sends all over the Cellar, Fumes that will intoxicate; and which are in such Motion that a lighted Candle being carried thither will be extinguished: and if this Wine be put in an Essay and shaken a little with the Hand, and you stop the Neck with your Thumb, the Essay will break in a thousand Pieces.

In *Burgundy*, that which they call an Essay, is a little round Bottle, in Length about three or four Inches and about two in Circumference, which grows less all of a sudden at the Top, in order to form a little Neck open, having a little Rim to receive the Wine and the Cork.

The Wine having cast its Fire and Scum out of the Casks; eight Days after they fill them up again, and stop them up with a Vine Leaf, which they spread over the Bung, and lest the Vapours of the Wine should move this Leaf out of its Place, they lay a little Stone upon it to keep it down; because if they should put upon it a Seal, or a Bung, the Wine not having Air, would push the Heads of the Casks out. Five or six Days after they seal it, and near the Bung they bore a Hole, and stop the Hole which the Gimlet has made in the Ton with a little Bit of round pointed Wood, which they call a Faucet, which they take out from Time to Time to let the Spirits evaporate; which Precaution prevents the Wine from bursting the Vessel.

This is the Time when at *Beaune* are to be seen the Merchants from all the Corners of *Europe*, who come to secure the best Vats for their Kings, Princes and Masters.

The Commissioners and their Wine Conners prove the Wines, although they are not yet drinkable. The

Commissioners are the publick Managers; to which all those who would have the Wines of *Burgundy*, address themselves either by letters or in Person. These are the Judges, which, Time out of Mind, from Father to Son, have certain Experience of all the Vats; who know the Climates, Closes, and the Cantons, from which they are produced, and all the good Cellars; to whom it is sufficient to write for what Quantity of Wine one would have, and of what District or Canton one would have it; and, provided they have the Purchase Money paid in the Space of the current Year, one may be sure to be well served.

These Managers, having received all the Commissions from private Persons, go to the Citizens, and fill their Essays of the different Vats which they find in good Cellars; and with the Tickets that they tie to the Neck of every little Bottle, or the Name of the Vat, with the Quantity of the Pieces of Wine which they contain, they carry them to their Houses, and let them be unstopped. They examine and attend them carefully, and by the different Changes, Taste, and Colour, they see the future Colours and Qualities of the Wines, that are in the Tons from which the Essays are taken. They also make yet another Proof with the Wine which is in the Essays; they take Glasses, upon which they put a sinking Paper, which they spread, and which juts out over the Glasses, and press their Finger to make a Concavity; which may contain a fourth Part of a Glass of Wine. The Liquor passes by little and little and filters through the Paper, and drains Drop by Drop in an imperceptible Manner into the Glass which receives it. By the Sight of the Wine which passes through this Paper, they make good Conjectures, founded upon long Experience, concerning the destined Taste, of the Colour, and the Lastingness of the Colour, of the Wines they have proved.

The Commissioners having made their Purchases according to the Orders which they have received from their Correspondents and Merchants, they make Preparations to send them according to their Orders; and as to the Price of the Purchase, they cannot deceive any Person without running great Risques, for if they should make those who send for these Wines pay more for them than they can buy them for in the Cellar, they would expose themselves to Hanging by an Arret of the Parliament of *Burgundy*, who have made a Law, for the ascertaining the Fidelity of the Commerce of those Wines; which orders, that the Commissioners shall take one *Sol per Livre* for as much as comes to sixty Livres; and for what exceeds this Sum they shall not take more than six *Deniers per Livre*. Thus a private Person who shall receive for six hundred Livres of Wine *French* Money, shall pay three Livres to the Commissioner for what he shall have sent above sixty Livres; and for the five hundred and forty which are over and above, for which he is to pay the Commissioner, he shall not demand more than six *Deniers per Livre*; which will be the Sum of twelve Livres six *Sous*; which being added to the three Livres above, make the Sum of fifteen Livres ten *Sous*; a Sum which would amount to twelve or thirteen Shillings, according to the Exchange; and for this small Profit, the Commissioner is obliged to advance his Money to the Citizens of whom

whom he buys the Wines; and that too, when he does not receive his Payment from the Persons to whom they are sent, as it sometimes happens. And the Commissioner that shall be convicted of taking more, whether by Books or other Proofs, will be punished as has been said above.

The Commissioners having purchased and proved their Wines according to the Orders they have received, they cause the Tons to be new hooped, and put Bars surrounded with Pins of Wood of the Aspen Tree, and mark them with the Town Mark. And it ought to be observed, that no other Country has a Right to imitate or counterfeit their second Hooping; and, for the greater Surety, they put upon each Cask the Fire Mark, which is a B on the Top, two Inches in Length, with the Cypher of the Year in which the Casks were sent from *Beaune* to go to any other Place.

These are the Precautions that are taken in *Beaune*, by which the Wines that come from thence cannot be mistaken; a Caution otherwise not very necessary, since they manifest themselves so plainly by their Delicacy, and Superiority above all the Wines in the Universe. They are besides very beneficial and proper to establish and preserve Health; in this surpassing the Wines of *Champaign*, which flatten the Taste, and grate the Palate; but which waken and extenuate, enervate, and render dull, as one may say the most healthful Bodies; and which also according to sad Experience, and the Writings of the Learned, which I have read, breed the Gravel, the Gout, and the Stone.

After having given an Account of the Situation of the Town of *Beaune*, and the Hills which produce the Wines of *Burgundy*; after having related the Manner of cultivating their Vineyards, and of making their Wine, of proving, choosing, and buying it; I shall next explain the different Qualities of the Wines which these divers Hills produce; and in order to this, I shall divide what follows into three small Articles; by treating first of the forward Wines; secondly of the Wines *de Garde*, or for keeping; and thirdly, of white Wines; and conclude in giving Instructions for the different Methods that are to be used in bringing the Wines of *Burgundy* to London, and advise how the *Beaune* Wine may be sent to London in Bottles.

The first Article of the Wines of Primeur, or the forward Wines.

We call that Wine of *Primeur*, which will not keep good more than one Year; or that can be kept but a few Months of the second Year.

The first Wine of *Primeur* grows at *Volnet*; which is a Village situated about three Miles from *Beaune*, upon a Descent of a Mile in Height at least, and two Miles in Length on the Side which is exposed to the rising Sun. This Village, as well *Pomard*, have their Dependence on the City of *Beaune*. Since the Citizens have been their Lords, as I have said before, these two Plots of Vineyards have been obliged to receive the Law of their Vintages from the Magistrates and Sages named for this Purpose.

This Hill produces the finest, most lively, and most delicate Wine of *Burgundy*. The Bunches of Grapes of the Vineyards of *Volnet* are very small, as well as the Berries. The Branches rise scarce above three Feet

high, through the whole Year. The Grapes of it are so delicate, that they will not bear the Vat more than twelve, sixteen, or eighteen Hours; for if they be suffered to stand longer, they would take the Taste of the Stalk.

This Wine is in Colour a little deeper than the Eye of a Partridge; it is full of Fire, strong, and light; it is almost all Spirit, and is in short, the most excellent of all *Burgundy*; which, by reason of its Violence, is not traded in; but its intoxicating Quality is soon dissipated. The Duration of the Wine is from one Vintage to another, though it perishes at the Beginning of the Dog Days, after which it changes its Colour, and is turned, but yet I doubt not but that it would keep longer in very cold Vaults. The finest of their Vats is drawn from a Canton of Vineyards that is called *Champan*.

Pomard is the second Plot of Vineyards of the *Primeur*; it is situated between *Volnet* and *Beaune*, not quite so high as the first, and a little higher than *Beaune*. It produces a Wine that has a little more Body than the preceding, is of the Colour of Fire and has a great deal of Perfume and Balsam; it will hold good some Months longer than that of *Volnet*; it is more merchantable, and better for Health; if it be kept above a Year, it fatens, ropes, wastes, and becomes of the Colour of the Skin of an Onion. The best Vat is that of *Commaraire*, which will sometimes keep eighteen Months, but that is according as the Year is.

The City of *Beaune* contains one very considerable Plot of Vineyards; it contains only four Hills, which are about four Miles in Length from *Pomard* to *Savigny*. The first of these is called *St. Desire*, the second the *Montée Rouge*, the third *Les Greves*, and the fourth the *Fountain of Marconney*. These different Soils produce Wines which participate of those of *Volnet* and *Pomard*, without the Faults of them; they have a little more Colour, many good Qualities, and Lastingness.

The Wines of *Beaune* last some more, and some less; but they do not last above two Years; they are sweeter, more agreeable, and more merchantable, than the two preceding, and much better for Health. The Colour of these Wines is not equal, because that depends much upon the Manner of making them; or that they let it remain more or less Hours in the Vat, according as the Climate is more or less delicate where it is made. There are in these four Hills, certain inclosed Cantons, which are in great Reputation. The *Fèves*, *Cras*, *Greves*, as also the King's Inclosures, are very delicious.

Aloffe is the fourth Vineyard of the *Primeur*; it is situated upon the Declivity of a Hill about three Miles from *Beaune*. This Valley is an Ascent so gentle, that one can scarce perceive that one ascends, till one has come to the Top of it. This little Village produces Wines of an extreme Delicacy; they are less brisk than the former, but of a Taste more flattering. The Colour is a little more soft, and less sparkling, but fine; and like the Hill that produces it, the Wine is too little elevated and too much declining; it partakes neither of the Firmness, nor Stiffness, of the Wines of the Height of the Hills; it has all the Tenderness, none of the

Hardness, and of consequence is subject, in a little while, to grow ropy, and to take the bad Quality of Sweetness; nevertheless, it is sent to foreign Countries; but it requires much Choice and Judgement.

Pernand, which is between the last Vineyard and the grand Vineyard of *Saigny*, is of a greater Extent, but is of small Account, the Wines not being very delicate. They are of the Quality of the preceding Vineyards, but harder and firmer, because they are produced upon a Hill that is higher and steeper. There are some Vats very delicious, and these go into other Countries, but under the Name of *Beaune* Wine.

Chassagne is not very considerable for its Extent, but is of great Reputation for its Wines. This, in my Opinion, would be more fit for *England*, because it would better bear Carriage by Land and Sea. It is extremely strong, full of Fire, and heady. It is commonly tart, which renders it more durable than the others; but if Persons have Skill and Leisure to bottle it in the proper Time, and to drink it when its Tartness begins to fall, it is one of the noblest Wines in the World. If I had the Office of providing the King's Wine, I would go into *Burgundy* to choose it; and in choosing the Wine of this Climate, I should be likely to succeed. This is the only Wine that one may leave in Bottles without Fear of its growing ropy, changing its Colour, growing eager, or turning. The longer you keep it, the better it is.

It is more balmy and nourishing; but nevertheless you may not prescribe above three Years for the Bounds of its Duration. It will be fit for drinking at the End of the second Year; sometimes it lasts four Years, when the Vintage has been very good.

This is the Rank of Wines in the *Primeur*, though its Duration is a great deal longer.

Saigny is a great Extent of Ground between *Beaune* and *Pernand* situated in a Valley formed by the Separation of the two Mountains. As the Hills that compose this Vineyard are open to the rising Sun by a great Space, and as they are shut up as they approach to the setting Side, they participate of the Rays of the Sun obliquely, and on the other directly. This Soil produces excellent strong racy Wines, which have both Body and Delicacy, when they have been drawn out into Bottles; but they must be visited now and then, so as not to let slip the Time when they should be drank. This would be a very good Wine for *England*; it will keep as well, and better than *Chassagne*; it is not so delicate, nor so brisk, but it is more oily and very good for Health.

Auxey is pretty near of the same Situation, in a Corner between two Hills, which open themselves to *Mussault*, or as far as *St. Romaine*, where may be seen high Mountains crowned with very high Rocks. This Vineyard produces Wines more red and strong than those of *Saigny*; but they have not the Reputation of them. These Wines have more Body than the preceding, and ought to be the Drink of all those Gentlemen that would not shorten their Days by drinking those heady sparkling Wines, an Excess in which is so dangerous.

The second Article, of the Wines de Garde, or those which will keep a great while.

Nuis is a very small Village, about nine Miles from *Beaune*, in the Road to *Dijon*. The Territory of this Village contains between four and five Miles in Extent. All those Gentlemen that love the most delicate and healthful Drinks, have the Wines of the Hills of *Nuis* for their Tables. These Wines are at first very rough, sharp, and tart; they require to be kept till the second, third, fourth, and fifth Year; and when their Roughness and Hardness are gone, their Tartness being fallen, there comes in their Place a Perfume and Balminess very delicious; they are of a deep Velvet Colour, and yet neat and brilliant. *Lewis* the XIV. drank no other Wine.

The Close of *Vogot* is situated a League from *Nuis* on the Side of *Dijon*; it appertains entirely to the Monks of the famous Abbey of *Cîteaux*, built between the *Saone* and this Hill. The Wine which it produces, comes nearer to that of *Chassagne* than to any other; it is very excellent, and is drank in foreign Countries.

Chambertin produces, the most valuable Wine of all *Burgundy*; it is situated between *Dijon* and *Nuis*, and contains the Qualities of all the other Wines without their Faults. This is what one may forget without Fear, I have drank it six Years after it has been produced, and it poured troubled and thick into the Glass, but grew clear immediately and by its Motion recovered its Spirits, and a Colour the most lively and neat; and they also sell it as dear again as the other Wines of *Burgundy*. It was sold the last Vintage for forty and forty-two Pounds Sterling the *Chantier*; when the Wines of *Volnet*, *Pomard*, and *Beaune*, sold for not above twenty Pounds Sterling a *Queue*; which contains, as I have said before, four hundred and eighty *Paris* Pints.

The Third Article, of White Wines.

Before I begin to treat of white Wine, it is proper to let you know, that it is made from a masculine Kind of Grape. This has two Qualities that the Grapes of the other Colour have not. The first is this: That if the Vintage be late, and the white Frosts and great Cold come, it resists the hoar Frost; while the black Grapes grow sour, withered, and shrivel immediately.

The second is, That as soon as these white Grapes are cut, they must be put into the Press without entering the Vat, and without being trod as the black Grapes are, for if they were put there, they would give only a livid, ruddy, yellowish Liqueur. I thought myself obliged to acquaint the Publick with that.

Mussault is, after *Beaune* and *Nuis*, the largest Vineyard of *Burgundy* in Extent; its Wines are generally approved in *Germany*, the *Low Countries*, and throughout all *France*. The Wines which this Soil produces, in all hot and dry Years, are delicious, sparkling, agreeable, warm, and beneficial; they are not dear, and, if they were well chosen, they would give Pleasure to those that drank them. When they are kept above a Year and a Half, they sometimes grow yellow and eager.

Puligny is a Vineyard next to *Mussault*, but much more in the Plains, which produces the best white Wines. They are, within a very little, of the same Quality with the Wines of *Mussault*, but their Fame is not divulged, and the Name is almost unknown.

Alosse,

Aloffe, of which I have spoken in the Article of the first Wines, produces also excellent Wines.

Morabet is a little Plot of Ground between *Chassagne* and *Puligny* in the Plain, which is in the Possession of one Vein of Earth, which renders its Soil wholly of the same Kind. It produces a white Wine the most curious and most delicious in *France*, and there is no Wine of *Cote Rotie*, *Muscat*, nor *Frontignan*, that equals it; it produces but a very small Quantity, and it sells very dear, and, in order to have a small Quantity of it, it ought to be bespoke a Year before, because this Wine is always bespoke before it is made, but great Caution is to be taken not to be deceived, for the neighbouring Vineyards of this Close partake a little of the Quality, and oftentimes pass for *Morabet*, and therefore it will be absolutely necessary to have a faithful Correspondent. This Wine has those Qualities that neither the *Latin* nor *French* Tongue can express. I have drank of it of six or seven Years old, and am not able to express its Delicacy and Excellence.

I am now going to treat concerning all the Vineyards of the *Upper Burgundy*. Those who have passed the grand Road that leads from *Dijon* to *Lyons*, the Length of the Hills, will do Justice to my Exactness, and I desire those that have not been there to believe that this Relation is agreeable to Truth.

I have a hundred Times heard boasting of the Wines of many Hills near *Auxerre*, to which they give the Name of the Wine of *Burgundy*. It is true those Hills are in *Burgundy*, but they are ninety Miles distant from the true Hills, of which I spoke just now, which only produce these Wines of *Burgundy* which are in Reputation, and which they drink after two Manners, by the Nose, and by the Mouth, either both at once, or separately; both at once in that when one drinks them, the Pleasure which he has in the Smell, vies with the Relish it has on the Palate; and separately, so that a Person that has been used to drink it, may know whether it be the true *Burgundy* or not, by the Smell, or sweet Odour. The good Tasters taste it by their Nose, before they put it to their Mouths; and all the other Climates of *Burgundy*, as those of *Chablis* and *Auxerre*, have no such Quality as the true Wines of *Burgundy* have, although they are really made and produced there.

It remains for me to relate how these Wines may be brought to *England*. It has always been the Custom to bring those Wines from *Burgundy* in their Casks; but as the Carriage is long, and there is oftentimes a Risk run, so the Carriers as well by Land as by Sea, are not always faithful; for notwithstanding all the Precaution that can be taken to hinder it from drinking the Wine, they will always find out ways to do it. If it be packed up in Casks with Straw and Linen Cloths, this is but a feeble Obstacle to their Industry. And for all this Precaution, if the Cask happens to leak by the Way, this will be at the Peril and Loss of the Purchaser. If these Wines be put into double Casks, this Precaution will have no better Success than the foregoing, and is exposed to the same Risk; and the Casks of the best Vintages are a great Prejudice to the delicate Wines, because this gives the full Scope to the Spirits to evaporate, and

of consequence they will cause a great Diminution of the Quality of the Wine.

It ought to be brought in Bottles from *Beaune* to *London*: For this Purpose, some Agent who buys the Wines by Order of the Person, should be addressed to; to draw it out into Bottles, and to send it in Casks to *England*. These Casks being filled, need not be carried by Land above ninety Miles to *Auxerre*, where they may be embarked on the River *Yonne*, which passes into the River *Seine*, and from thence to *Paris*, and afterwards to *Rouen*, where are Vessels which pass very often to *London*.

The Agents of *Beaune* would also be very well pleased to bottle the Wine that they were ordered to buy, provided their Correspondents would give Orders for enough to make a Carriage. As for Example; if two or three Persons would join to give Orders for a thousand Bottles, this would be a complete Carriage; and as those of *Volnet* draw their Wines into Bottles at the End of *December*, a Person that would have five hundred Bottles of *Chassagne* or *Nuis*, ought to join with another that would have the like Quantity. The Agent might bottle up these Wines a Year after the Vintage, either more or less; and the Purchasers might receive the Wines of *Burgundy* exquisite and delicious; and in like Manner all other Wines that they have a Mind to have. As to the Price of the Wines of *Beaune*, *Volnet*, *Pomard*, *Chassagne*, and *Nuis*, it is pretty near equal, or at most the Difference is not very great. A *Queue* of *Volnet* Wine contains four hundred eighty *Paris* Pints, which will make five hundred Bottles, and will cost in the Country, some Years ten, twelve, fourteen, or eighteen, and at most twenty Pounds Sterling. The Carriage may cost to *Calais* twelve or thirteen *Livers*; and afterward from *Calais* to *London* a very small Matter; so that taking the Years one with another, the dearest Wines of *Burgundy*, except that of *Chambertin*, which is the dearest, would scarce, in *London*, stand in fourteen or fifteen *Sols* a Bottle, the Customs not being reckoned in.

The Method of making Wine in Provence.

The Delicateness of the Taste of Grapes is not always a certain Proof of their Goodness for making Wine; it is not always with these Grapes, so agreeable to the Taste, that the best Wines are made: We should not be surprized, that our Wines are not the most exquisite, since we do not observe any Rule in the Choice of the Grapes, which ought to be done.

It is certain, that the Juice of Grapes, of different Kinds, cannot but produce a confused Mixture, which suffers divers Alterations in the Casks, by the different Fermentations, which the sulphureous Particles of the Grapes excite there; by which they suffer themselves to be very easily opened at the approach of Heat. This is what happens to Wines which have been made of a Mixture of many Kinds of wild Grapes. Experience informs us, that Wine drawn from such Grapes is very subject to ferment, and grow foul, as soon as the Heats of the Spring begin to approach; which does not happen in the Winter, when the Coldness of the Air holds it, as it were, bound and embarrassed by the sulphureous Particles of the Wine. It is the same Thing in the Juice of the Grapes called *Claretos*, *Plans*

Estrans

Estrans, Pignoletts, &c. when they are mingled in too great a Quantity with the others. The common Fault of our Wine is, that they cannot be kept the Year throughout; they are apt to grow foul, or turn, as it is called, upon the least Transport.

The greatest Part of our Citizens believe it to be the Fault of the Soil, principally the Vineyards planted in the Places where the Bottom of the Soil is Plaster or transparent Stone, which is the Case of all that Extent of Ground, which begins from *R. P. Capucins*, as far as *Aguilles*, which they commonly call *Payblanc*; i. e. White Country. But how many Vineyards have we planted in different Soils, that are subject to the same Vice? It is generally agreed, that the Soil which they call *Gris* [Gray], is the best for Vineyards; nevertheless, it is found, that the Quarter of *Molieres*, of *Repentance de Barret*, and of *Montaguez*, are not exempt from this Vice. I am of the Opinion, that it proceeds from the Mixture of too great a Quantity of different Sorts of Grapes. I cannot deny, after Experience, but the Nature of the Soil, the Culture, and the Dung they use, contributes very much to this Vice; which is what I shall hereafter examine into.

Therefore it is necessary to know, what Grapes are fit to make good Wine, that may be in a Condition to be kept without being foul, or turning, and how to make it.

It is very true, that a Person cannot make from one Vineyard a great Quantity of Wine, that shall be at the same Time good in Quality. A Vineyard ought to be planted on those high Grounds or Hills, which are exposed either to the South, or South West.

And the Soil ought to be a Sort of brown, or approaching to it. Those which we call *Arpielo*, *Malause*, and *Saveon*, are Soils which are scarce proper to nourish Stocks that will produce Grapes for making good Wine. The Vineyards which are round about the *Peris Augustins Reformez*, commonly called *Saint Pierre* are planted in a Soil of *Saveon* aforesaid, very unfit for producing Grapes of a delicate Relish, or for making good Wine.

The Entrance into the Territory of *Tbolonet* is, for the most Part, a Soil which our Country People call *Malause*; and also the Wines that they produce are none of the best.

Those Grapes ought to be chosen, which grow upon Stocks that are planted in a Soil somewhat rocky.

As to the Culture it is certain, that good Wine cannot be drawn from Grapes that have too much Nourishment, and of which the Sap has not attained the least Degree of Concoction or Ripeness.

Those which we call *Ollieros*, which are commonly dunged, and which they cultivate with Pains, give a great Quantity of Grapes; but their great Nourishment is an Obstacle to their making good Wine. Those which we call open Vineyards, are to be preferred to them.

We ought also to prefer the Grapes of old Vineyards to those of young ones. The proper Vineyards for making good Wine, are those which have been planted twenty five or thirty Years, the older they are, the more proper they are for making good Wine; and till

the Vineyard has been made seven or eight Years, good Wine ought not to be expected from it.

As to the Choice of Grapes, we ought to mix some of the best Sorts that we have. These Kinds are, of the white Grapes, the *Aragnan*, *Roudeillat*, *Pafeau Blanc*, *Estrani*, *Uni*, and *Aubree*. Of the black, the *Catalan*, *Bouteillan*, *Uni Negré*. The Must that is drawn from these Grapes ought to ferment in the Vat at least three Weeks; when the Hufts must be separated from the Must.

It ought to be noted, that the Proportion which should be kept between the quantity of these Kinds is different according to the Design which every one has of keeping these Wines.

The black Grapes, and above all the *Catalan*, and the *Bouteillan*, should make more than half the Quantity of all the rest.

Those that desire to have a Wine of a deeper red, should take a greater Quantity of black Grapes, and ought to let them stand a longer Time in the Vat, if they have Occasion to change the Wine from Time to Time.

They make White Wine of the Grapes they call *Aubier*, *Uni*, *Roudeillat*, *Aragnan*, *Pignolet*. If they would have Wine proper to keep in the Heat of Summer, the ought to use none but *Uni*, *Aubier*, and *Aragnan*.

Nobody is ignorant, that we have Wines made of but one Species of Grapes; as that of *Muscat* Wine, and *Claret*: For the first they make use of Muscats, as well white as red; for the second, of the Grapes they call *Clareto*.

They keep these Grapes with us, during the whole Winter, and some Part of the Spring, hanging upon a Beam in a Room. All Sorts of Grapes are not fit for keeping; those Kinds that are called *Pendoulans*, or *Rin de panse*, *le Land de Poüere*, *le Verdau*, are the best for this Purpose; the *Aragnan* and *Estrani* are so likewise; also the *Clareto*, *Muscat*, and red *Uni*; the *Barbaroux* and the *Espaguin*, the *Taulier*, and the *Roudeillat*, will not keep so long. They ought to be gathered full ripe, and before the Rains; and none to be chosen but those that grow upon old Stocks.

They also preserve those Grapes to make what the *Latins* call *Uva Passæ*; not because dried in the Sun, but because they are exposed to the Sun hanging; they call them in French dried Grapes; the *Provincials* call them *Panses*. They make Use of none but Grapes called *Rin de Panse* or *Pendulem*, or of *Rin Panse Muscat*, to make the best *Panse*. They also make use of the Grapes which are called *Aragnans*, which is the most common *Panse* in the hottest Places.

They also make use of the Grapes called *Roudeillats*, and the *Plan Estrani*. The Grape which we call the *Land de Poüerre*, is not made use of with us for this Purpose, although I have been informed, that they are used in hot Countries near the Sea Coasts. They make their *Panses* with us, after the following Manner; they tie the Grapes in a String, and put them upon another String at both Ends; then they plunge them into a boiling Lye, in which they mingle a little Oil, until the Grapes shrivel, and afterwards expose them to the Sun for six or seven Days; and then they lay them in Rows in Cases, pressing them gently.

Wine is different in Virtue and Delicacy of Taste.

The

The Difference proceeds, for the most part, from the different Natures of the Grapes with which it is made, the different degree of their Maturity, and the Diversity of the Soil where the Vineyards are planted; and also the different Culture of the Vineyards, and the Preparation of the Wine; to which may be added, the Difference of the Climates, according to the greater or lesser Degree of Heat.

The Romans, as we learn from Pliny, were very curious in searching after the most excellent Wines: All their Differences consisted in the Places where they were made; as the *Setinum*, *Cæcubum*, *Falernum*, *Gauranum*; *Faustianum*, *Albanum*, *Surrentinum*, and *Massicum*, which were the most delicate Wines of Italy in the Time of Pliny. Among the Wines of Greece, they esteemed the *Maronæan*, *Tbassian*, *Cretan*, *Coan*, *Chian*, *Lesbian*, *Icarian*, *Sinyrean*, &c. Their luxurious Taste carried them in Search of the Wines of Asia, as that of Mount *Libanus*, and others as may be seen in Pliny.

It is to be noted, that the Romans had their most excellent Wines from *Campania*, which is now called *Terre de Labour*, a Province of the Kingdom of Naples. Those of the other Parts of Italy did not come near these last in Point of Excellency. The *Falernian*, *Gauranian*, and *Massic*, were made from Vineyards planted on the Hill round about *Mondragon*, at the Foot of which passes the River *Garigliano*, antiently called the *Iris*. The *Cæcuban*, which differs nothing from the *Falernian* but in Age, (this is that which the Latins call the Length of Time which the Wines are able to preserve their Strength), was produced in the *Terre de Labour*, as the *Fundanum* and *Amyclum* were near *Gæta*, the *Suessanum* of *Suessa Pometia*, a maritime Territory of the Kingdom of Naples; the *Calenum* about the Town of the *Terre de Labour*; and also many others, with which that Province furnishes the City of Rome.

These Wines which are very excellent in their Nature, acquired rather by Age, than by Art, a Degree of Perfection to which none of the other common Wines of Italy can attain.

The last, which the Greeks call *Oligophora* and the Latins *Tenuia* and *Paucifera*, are very easily preserved by the Cold, or rather by a fresh Air, and grow eager by Heat. Also those which the Greeks call *Polyphora*, *Multifera* and *Vinosa*, become more vigorous and spirituous by the Heat.

The Grapes of which the first are made, abound in crude Phlegm; the sulphureous Parts of the Must are more dilated. The last, on the contrary, are drawn from Grapes that are more ripe; of which the Must or the sulphureous Parts which compose it, are concentrated, and fixed by the Evaporation of the humid Parts which dilate it. To this may be added, the Abundance of the Sulphur of these last, which is the Cause of the true Strength of these Wines; and it is by being opened that they acquire this Spirituousness. It was only to procure this Opening, that the Antients invented the preparing these Wines in the Manner I am going to express.

Pliny informs us, that in the Year 633, from the Foundation of Rome, they lodged their Tons full of Wine in Places covered, which were exposed to the North, such as we now call Cellars.

On the contrary, those Casks which were filled with vigorous and spirituous Wine, such as *Polyphorum*, were set in an open Place, and exposed to the Rain and Sun, and all the Injuries of the Weather. Those which contained Wines of less Strength, were kept under Cover. Those which were full of a weak Wine, were put into a hollow Place and covered with Earth.

Galen, in his Book *de antidot. Chap. 111.* and in the *Treatise of Vines*, that is ascribed to him, remarks very much to the Purpose, That the Wines of the first Order, or *Polyphora*, were preserved two or three Years in these cold Places; but if they let them lie there too long, they grew eager, if they did not remove them to warmer Places; as they used to practise in Asia, before the Romans had any Knowledge of it; and it was by this Means that the People of Asia, as well as the Romans and Greeks, attained to the Art of making Wine keep so long.

The most antient Epochæ of the Preparation of these Wines among the Romans (as Pliny says) was about the Year of Rome 633. This Authour who lived a long Time after in Vespasian's Time, assures us, that these Wines had been kept for the Space of a hundred Years, and that they grew thick to the Consistence of Honey, so that they could not be drank without mixing them with Water.

He also adds, *Quo generosius est vinum, eo majus vetustate crassescit*; i. e. by how much more generous the Wine is, by so much the more it grows thick by Age. The same that is seen in our Days in the Spanish Wines.

This Thickness of the Wines, of which I am speaking, is less extraordinary than that of the Wines of Asia, of which Galen speaks in his Book of Respiration; which being inclosed in large Flasks, and suspended near the Fire of their Chimnies, acquire, by the Evaporation of the Humidity, the Hardness of Salt. What Aristotle says of the Wines of *Arcadia*, exposed to the Fire and the Smoke, is yet more surprising; *Ita exsiccat in utribus, ut derafum bibatur*; i. e. so dried in the Bottles, that it is scraped off to be drank. It was so solid, that they were forced to scrape the Flasks to drink it, and could not drink it without diluting it with Water.

The Romans prepared their Wines after the following Manner: They took the Must that had run from the Grapes that had been trod; they put them into a wooden Vat, of which the Staves had been bound together by Hoops, or flexible Bands.

After the Wine had been fermented all the Time necessary for separating the grossest Impurities, they drew it out of the Vat to put it into Casks, where it continued to ferment, and, to assist the Depuration, they mingled as much Plaster, or Chalk, or Clay, or Powder of Marble, or of Pitch, or of Salt, or of Resin, or of Lee of new Wine, or of Sea Water, or of Myrrh, or of aromatick Herbs, as they judged necessary, every Country having its particular Mixture. And this is what the Latins call *Conditura Vinorum*.

They left the Wine in the Casks until the Spring following; also many left them until the second or third Year, according to the Nature of the Wine, and the Country; afterwards they drew it out to put it into earthen

earthen Vessels, which they did over on the Inside with melted Pitch, and marked on the Outside the Name of the Place from whence the Wine was made, and that of the Roman Consuls, in whose Consulate it was made. The *Latins* called this changing of the Wine from Casks to earthen Vessels, *Diffusio Vinorum*, or *Vina defundere*.

They had two different Sorts of Vessels; the one the *Ampbora*, and the other the *Cadus*. *Pancirollus* and others say the *Ampbora* was of a square or cubick Figure. As to the Contents, Authors are not agreed, but most supposed they held about eighty Pounds of Liquor. This Vessel was contracted at the Neck. After it was filled with Wine, they stopped the Mouth close with Cork. The Cade was of the Figure of a Pine Apple, which is supposed to contain half as much more as the *Ampbora*. These Vessels, being stopped, were carried into a Room exposed to the South, situated in the highest Story of the Country-house where the Wine had been prepared. This Place was called *Apotheca*.

It was to dissipate the superfluous Humidity of the Wine, that they exposed these Vessels to the Heat of the Sun, and of that of the Fire, and of the Smoke, which has given to this Place the Name of *Fumarium*, because of the Smoke which was gathered by the Funnel, through which the Smoke of the Fire was carried off, when it was lighted below.

These Wines could be kept for two hundred Years, and would, as has been said, arrive at the Consistence of Honey, during which, *Adhuc Vina ducentis fere annis jam in speciem redacta mellis asperi; etenim hac natura vini in vetustate est*, says *Pliny*, Lib. xiv. cap. 4. So that it is troublesome to drink this Wine because of its Thickness, and in order to render it drinkable, they diluted it with warm Water to give it a Fluidity, and afterwards they passed it through a Strainer, and this they called *Saccatio Vinorum*, as *Martial* says,

Turbida sollicito transmittere Cæcuba sacco.

It is true, they had other Wines of the same Nature, which they did not pass through a Strainer, as the *Massicum*, which they only exposed during a Night to the Air, to procure a Fluidity and Depuration, as *Horace* says, Lib. ii. Sat. 4.

*Massica si cælo supponas vina sereno,
Nocturna, si quid crassi est, tenuabitur aura,
Et decedet odor nervis inimicus: at illa
Integrum per hunc lino vitata saporem.*

This lukewarm Wine had been very disagreeable to drink, if they had not cooled it with Ice or Snow, whether in mingling it with the Wine, or setting the Bottles in Ice. The most Luxurious mingled the Snow with the Wine, and passed it through a Silver Strainer, which *Paulus*, the Jurisconsult, calls *Colum Vinorum*.

Of the Method of planting Vineyards in Orleans.

Of the Distance that should be given to the Rows, and the Breadth of the Paths, when a Vineyard is planted.

The different Kinds of Plants. Of planting between, and of digging up old Vines, and planting again.

The Trenches ought not to be opened till after the Ground that is designed to be planted has been marked out, to the end that a Length and Breadth, proportionable and uniform, may be given to all the Rows and Paths, as much as the Ground to be planted will permit.

And forasmuch as the Vine receives its Nourishment in the Trench, it will be proper to give it some Inches in Breadth more than to the Paths.

The most common Practice is to allow five Feet in Breath for the Trench, and as much for the Path, when red Wines are planted, especially the *Auvernats*, whose Branches ought always to be trained pretty long. This is the best Method for this Sort of Vines, and the Plants ought to be planted two Feet six Inches distant one from another. Some do not exactly observe this Distance; they allow but four Feet and a Half for a Trench, and the same for a Path.

There are also some that allow but a Foot and a Half Distance between each Plant, when the Trench and the Path have no more Breadth than that which I am about to mention, but the Vines planted so close together ought, of Necessity to be twisted circularly; and as their Roots will in a few Years, run one into another, the Vines will not last so long; besides, they will require to be a little oftener and more plentifully dunged than those that have been planted at a greater Distance.

Others on the contrary, allow near six Feet for the Breadth, and sometimes more for the Trench, and the Path, but this certainly is greater than is possible to dig or cultivate between the Stocks, which is the best Manner of performing this Work. And when they dig otherwise, they will have a great deal of Trouble to work to the Middle of the Trench, which nevertheless ought to be as well digged as the rest.

But the *Vignerons* of *Burgundy* do not dig the whole Ground, for when the Distances are so large, they content themselves to touch but lightly the Middle of these Trenches, and only dig about the Rows of Plants. It is then advantageous for the Citizens not to give so much Breadth to the Trenches.

Those *Vignerons*, that purchase or rent Vineyards which have the Trenches so wide, pluck them up oftentimes, that they may be able to plant others there, where they allow much less Breadth for the Trenches, and the Distance between the Plants, without concerning themselves about the Vines lasting the less while.

But the Citizens ought to follow a better Method, which is, to give five Feet for the Breadth of the Trench, and as much to the Path, and two Feet six Inches for the Distance between each Plant, especially when one plants Vines of *Auvernat*, because these will furnish Layers, so the Trench must necessarily be larger, and the Plants at greater Distances the one from the other, that they may find more Nourishment, and that the Shoots of the Vines may be extended the better.

A Vineyard planted after this Manner will last longer, will defend itself better against the Winter's Frosts, will produce finer and better Fruit, which will ripen better, and of Consequence make better Wine, and also the *Vignerons* of *Burgundy* would find their Account of planting their Vines in this Manner, in that they would have fewer Vines to tie, to-prune, and to disbranch, &c. because there are a great many fewer Plants in those whose Trenches and Paths are wide, and the Plants less crowded, and for this Reason there would

would be but few *Vignerons* but would be of this Opinion.

When I say, that when one plants *Auvernats*, they should have five Feet in Breadth for the Trench, and as much for the Path, and two Feet six Inches Distance between each Plant, I speak of those Vines planted in a very good Bottom of Earth, because they will last many Ages without being renewed after the usual Manner.

For as to those Lands where one is obliged to renew the Vineyard in about twenty or five and twenty Years, it will be sufficient to allow four Feet and a Half for Breadth of the Trench, and the same for the Path, and twenty Inches for the Distance between each Plant, because these Vines will not last a very long Time, by Reason the Roots will grow large, and spread far in the Earth, in such a Manner that they would injure one another. I suppose, nevertheless, this Land to be passably good, for otherwise the Breadth of the Trench and the Path must be greater, and the Distance between each Plant, or the Vineyard must be the oftener dunged.

There are two Sorts of Plants, those from Cuttings, and from Layers.

The Cutting is a young Shoot of the same Year that has no Roots; they always leave at Bottom a Knot of the Wood of the preceding Year. These are the most commonly used. They give it no other Management than to cut off the Claspers, and the Tops, at the same Time that they take them off from the Vines, and lay them down in the Earth in a Bundle, when they cut them before Winter, and cannot plant them till the Spring.

This Plant is good and commonly succeeds when it has been well chosen, being planted in Lands well disposed and well cultivated, but yet there is an Inconvenience in using it, and that when it is to be planted in Lands that are naturally moist, or that retain the Water. If it be planted early, and there fall cold Rains in great Abundance, the Plant soaks in the Water, and the Skin or Rind comes off, and it perishes instead of taking the Root; and if it be planted too late, and the great Heats and Droughts overtake it before it has put forth Buds that are passably strong, it is scorched, wherefore it is better to make use of the second Species of Plants, not only in these Sorts of Lands, but all others.

The Layers are the long Shoots of Vines of three Years Growth, which have been layed down in the Ground, and have put out small Roots; these are better, and less liable to fail; they may be planted at all Times in Winter, and in any Kinds of Lands, provided they are such as do not retain the Water. In this Case it were better to wait till March to plant them, or at least till the Ground appears healthful, for we should never plant in Ground which is very wet.

Before the Layers are planted, they ought to be pruned, that is, to cut off a few of their Roots, and when they are weak at the Place where they were bent, these must not only be cut, but also the other Branches or Spurs, leaving that which has the most and strongest Roots.

The Layers are a great deal less subject to soak in the

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Water than the Cuttings, because having Roots before they were planted, they make new ones sooner than those which have none.

It is true, these Layers are more rare than the other, but it is an easy Matter to render them common enough, because one may have whole Acres of them, and all the Precaution that is necessary for it, consists in making Layers, when they are well grown, from the Shoots.

These may be planted in two different Places, either in some Piece of Land designed solely for this Purpose, or in the Middle of each Ridge, at the Time that a Vineyard is planted.

If they be planted in a particular Piece of Ground, they must be laid in Rows betwixt the Vines, so that betwixt each Row and the Shoot there may be a sufficient Distance, that the Shoots may not hurt one another, and that the *Vignerons* may have Room to pass between them when he is trimming them, for he must hoe them three Times a Year to hinder the Weeds from growing about them, and choking them, and depriving them of a Part of their Nourishment.

This Portion of Ground is a Sort of Nursery, since the Gardeners make them, that they may have Plants to plant in those Places where they are wanting.

I am also of the Opinion, that it is the Prudence of a Citizen to have on his Estate (especially since the Cuttings do not take Root but with Difficulty) a Place where he may always have Layers in as large a Quantity as he pleases, or shall suffice for all those that shall not succeed, at least if they be not well chosen, and which require a particular Care in their Cultivation.

I shall consider, at the End of the following Article, after what Manner we should plant the Layers in the Ridges.

It is for the Interest of a Citizen to order his Affairs so, that his Vineyard may be always full of Plants, to the end that it may produce a good Quantity of Wine, because it often happens, notwithstanding all the Precaution that can be taken to keep a Vineyard well furnished, that it will want to be supplied, by reason of the Quantity of Plants that die from Time to Time, because one cannot always supply their Places by the Means of Layers, and likewise sometimes there will not be Wood enough upon the Vines that are near for that Purpose, and that it would not be proper to make use of the Top of the Shoot, for several Reasons that might be given, and therefore it will be proper to place Plants between the others.

Some *Vignerons* will say that it is very rare that these middle Plants succeed in a Vineyard where they are planted, to which it may be answered, that it is true, that a middle Plant may not succeed, when the Earth has not been well prepared before the Planting, or when it has no other Management but that of the Vineyard in common, but it is very certain that it will scarce fail, if Care be taken, after the Vintage, to pluck up the dead Shoots, to open the Earth to a good Depth before Winter, not only to the end that it may mellow, but also that the Vines may not be damaged in cutting off Part of its Roots, by which it would greatly be weakened, if it were to be done before the Spring, and if in every Hole were put a Basket of fresh Earth or about the twentieth Part of a Scuttle full of Well rotted

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Dung,

Dung, especially when the Plant is set in stony, clayey or gravelly Ground.

I have seen among Vines very strong in Wood, and of a hundred Years of age, a middle Plant very strong to the third Eye, and which always continued to do well, and I can affirm that these Vines are planted in as strong Lands as any are in our Plot of Vineyards. Now if the middle Plant does well there, as it is certain it does, we may take it for granted that it will still do better in those Lands which are light, and hence it is, that there is not any Land where one may not plant it, or where it will not succeed.

Perhaps the *Vignerons* may say that a middle Plant will be worth nothing among young Vines, because these push with so much Force, that their Shoots would choke it.

I agree that it may sometimes so happen, but then this is a Proof that the Year following there will be found in the Vineyard Wood enough to make Layers there. Therefore, it would be useless to set a middle Plant, because it is more likely to fail, and likewise it will not produce Fruit so soon as the Layers, which produce it the same Year in which they are made.

This Reasoning is more just than the Consequence that they would draw from thence; that is to say, that it would be useless to plant a middle Plant; for if a *Vigneron* should every Year cut off the Wood of the Vineyard, which might serve for the making the Layer, and not set a middle Plant there, the Vacancy that would be there, would never be filled; and this is the Reason that a middle Plant should every Year be set in the empty Places, to the end that they may be filled out with the Layers.

Of the Time and different Manners of planting a Vineyard.

Lands being of different Natures, there ought also to be different Times of planting.

In Lands that are sandy, or full of Flints, the Bottom or Soil of which does not retain the Water, one may plant and interplant after the Severity of the Winter, without being under any Apprehension of the Plants not succeeding; because these Sorts of Lands never retaining the Water, are always wholesome at the Bottom; and therefore the Plants set in them will succeed.

They do not ordinarily plant in the Lands of *Olivet*, *St. Mesmin*, &c. whole Pieces of Vines entire in the Places where they have been already, because the Custom is, not to pluck up in these Lands those Plants that they find good either as to Wood or Kind.

As for myself, I have always found, that these different Stools, mixed among very small ones, make a grotesque Figure in one and the same Piece of Land, and could never approve of this ridiculous Method.

In strong Lands, or such as retain the Water, one ought not to plant but in the Month of *April* or Beginning of *May*, because it is not easy to make a Vine take Root in these Sorts of Lands, the Years being often very hot and dry, or very rainy, which are equally to be feared, in respect to the Plant set in them.

And as, in an Estate of but small extent, it often happens that the Lands are of different Natures, and that of consequence the Plants of one certain Species will not do well but upon one Part of these Lands, and will succeed ill in another, and that the Seasons are dif-

ferent one from another, and since they too often happen to be either too hot, or too cold and rainy, and that the Kinds of the Plants are good or bad, according to their Nature, and that of the Ground on which they are planted, and the Disposition of the Season, I am of Opinion, to be more certain not to plant any Plants but what will succeed, and to have always some Vintage to gather, that it will be proper to plant several Kinds of Plants, according to the Lands that they will agree best with, especially if we be not very sure, that one Species of Plant will do better than all others: In such Case, we should plant none but that which may succeed there.

When I say that it is often advantageous to have different Kinds of Plants in a certain extent of Land, I do not mean that you should put many Kinds of Plants in one and the same Ridge, or in one and the same Row, as is common for *Vignerons* to do, when they plant Vineyards for those who are obliged to make but one Sort of Wine of all Sorts of Grapes, which, nevertheless, they would have passed for pure *Auvernat*, although there is not in it, perhaps, above a third Part, but I mean that in every different Kind of Land there should be planted but one Kind of Plant, to the end that, every Kind being separate, we may, in the Time of Vintage, easily make such Wine as we desire, which will be very difficult, if all the different Species of Plants be planted confusedly one among another, for there will scarce be found among the Vintage Gatherers, either Men or Women, such as have Skill enough to distinguish them, and besides, if they had, it would be a Loss of Time.

A Vineyard may be planted after two Manners, either upon the even Ground, or in open Rows.

In planting upon the even Ground, when the Land has been leveled and marked out, they make a Hole with a Spade to put in the Plant, but it ought, nevertheless, to be supposed that this Land has been prepared, and well trenched.

The Manner of planting a Vineyard in open Rows is almost the only one in Use in the *Orleannois*, and is, without Contradiction, the best. In that it is certain, that in planting in this Manner, the Earth has been opened and removed even to the Bottom, which by this means will become better furnished, and the Roots of the Vine will be capable of spreading themselves.

The best Time to plant Cuttings which have been bundled and buried in the Ground, is when the Rind swells, which may be known by a Kind of Protuberance rising round about the Wound, and also by the Buds being just ready to open, and that the Cuttings may not dry too much, they ought to be kept for some Time in a Vessel full of Water, and not to be taken from thence, but as they are planted, for if the Heat should shrivel those that are planted, they will not so readily take Root, and many of them might die.

For this Reason it is better to plant a Vineyard in a rainy moist Season, or at least cloudy, than when it is too hot, or there is a too drying Wind.

They commonly make use of two different Utensils of Iron to make the Hole where they put the Cutting of the Plant, either a Spade, or a large Kind of Pick-ax. The first is the most proper to make good Work, provided

provided the Earth be wrought the whole Length and Breadth of the Trench, and also the Depth that the Plant is laid, that is to say, as far as the Hollow of the Earth.

When they make use of the second Utensil, it is commonly with a Design to make bad Work for the lazy *Vignerons* content themselves in making a Hole to put the Cutting of the Plant in, without digging the rest of the Ground.

But by this last Way of planting it, often happens that the young Roots of the Plants finding nothing but hard Earth, into which they are not able to penetrate, it is impossible that they should be able to extend themselves as they would do, in a Land that has been exposed to the Air, Frosts, &c. by the good Digging that has been given it, when the Trench has been dug with the Spade the whole Length.

Of gathering the Vintage.

The Vintage of the *Auvernats* being the most precious of all those which we have to make in this Plot of Vineyards, in order to have good Wine, we ought to attend the Maturity of the Grapes.

And as there are certain Soils, where the Grapes, having been cut a little too green, are too much fermented in the Vat, and others, on the contrary, cut very ripe, are but little fermented, which keep the better. It is absolutely necessary that those who have those Vineyards do carefully apply themselves to be acquainted with the Quality of their Ground.

But one may say, in the general, of all the good *Auvernats* of this Country that they ought to have always one Point of green when they are gathered, particularly when the Year has been hot, and the Lands where they grew have been fat, or very much dunged, for it is not sufficient, when one would have good Wine, to cut the Grape in its Degree of Maturity, but he must take a fit Season to do this in. As thus, one ought neither to begin nor continue to gather when it rains, though many are not very scrupulous as to this Point, for they say the Wine will sell never the worse for it.

I own that it may sometimes happen so, but it ought to be allowed me that it has a bad Quality. One ought also to see to it, that the Dew, that falls often very plentifully in this Season, be entirely dissipated, and that there be no Dew either upon Grapes, or the Leaves of the Vines, for it is found by Experience, that for the little Quantity of Water there is in this Sort of Wine, it loses a great deal of its Quality.

Therefore the Season cannot be too fine for cutting the *Auvernats*, for this Reason: In a great many Vineyard Plots in this Kingdom, as in *Burgundy*, and other Places, where the Wines have great Reputation, they do not gather their Vintage, but during the finest Part of the Day, that is to say, the Gardeners begin their Work very late, and leave off some Hours before Sunset, and the Wine is the better for it.

It is true that sometimes it is good to wait for the falling of the Rains, but this ought to be some Weeks, or at least many Days, before the Vintage, and not in the Time of gathering.

As for Example: When no Rain has fallen for a long Time, and the Grapes have been shriveled by the Heat, that there is scarce any Thing but Grape Stones, and

a tough thick Skin. If one should gather them then, they would yield but very little Wine, and also it might turn to a Tartness, as it happened for the most part to the red Wines of the Year 1718, which was extraordinary hot and dry.

So then we ought not to gather the Grapes so soon as the Rain that we have waited for is fallen, because the Grapes ought to have Time to have the Advantage of it, which may be known when the Berries grow large, and fall upon the Ground.

As to the other Sorts whether red or white, they may be gathered with less Precaution, but they must always have their Degree of Ripeness, according to the different Lands on which the Vineyards are planted.

Of the Wines made in Orleans.

For a long Time, at *Paris* and other Places, there have been those who have endeavoured to decry the Wines of our Vineyard Plots, especially the red Wines. In the mean time it is observable that those, who speak of them with the greatest Contempt, cannot do without them, but procure them as they did formerly, either to put off their weak Wines, without Colour, or that some have other Faults, and also to preserve the finest, most delicate, and most celebrated.

For the Wines of *Burgundy* are no sooner brought in, than they mix them with our Wines to drink them, so long as they last, and there is this to be said of our Wines, that there is not one single Wine Merchant at *Paris*, who has not our Wines in his Vaults, not only for mixing with others which are meaner, but for selling without any Mixture, for though they have much Strength, yet, for all that, they do not fail to sell them pure, as well for their Tables as their Offices, to those that have the Curiosity to drink a Wine that is good, natural, and without Sophistication.

The Rapes which are yearly made, and the great Quantity of Wines, both red and white, which they are so solicitous to purchase a long time before they are made, in order to transport them from *Paris* into *Flanders*, *Holland*, and *England*, and as far as the *American* Islands, where they drink good to the very last Drop, are, in my Opinion, sufficient Proofs that our Wines are not so contemptible as they would represent them.

For it must be owned, that if they had not such good Qualities, or if they had any Fault, they would not come in Search of them so far, and would not take such Care to furnish themselves with them in Time.

Some say that our Wines being harsh, red, and too violent, they are not so agreeable to be drank, and that those that drink them to any Excess find themselves incommoded, which never happens to them when they drink the same Quantity, or even a greater, of the Wines of *Champaign* and *Burgundy*, and many other Vineyard Plots of the Kingdom.

I answer that these pretended Faults are the real Qualities of the Wines, and those are what cause them to be so much sought after, for this very Colour and Harshness (provided that it be not too much fermented in the Vat) serve to give a Quality to other Wines that are weak, which would never be verded to any Advantage without being mixed with others.

Besides, if the Harshness of them, which they some-

times have, be their Fault, this is not always so, it is but accidental, and may be prevented by letting them remain less Time in the Vat.

As for the Inconvenience that those are sensible of, that drink too much of it, it is a very easy Thing for them to remedy that themselves; they need only drink less of it, and then it would not incommode them.

As for Example: *Aqua Vitæ* is not drank in so great a Quantity as Wine, nor a strong Wine as a weak one. When the Wine is very strong, they ought to drink Water with it, or drink less of it; then it would nourish a Person, instead of wearing his Body, or stupefying his Spirits. Thus, when one is sensible of any bad Effects from our Wines, it is not from their Quality that they proceed, but from their Quantity, which People know not how to use rightly.

Whatsoever ill-founded Prejudice may be taken up against the Wines of our Vineyard Plots, it must nevertheless be allowed that we have the Advantage over the greatest Part of other Wines, that we are able to make them such as we would have, and such as are demanded, that is to say, a delicate Wine fit for present drinking, red without being harsh, and more or less hard, without losing its Quality, and thus we are able to make a Wine equally good to drink through the whole Course of the Year, and also for many Years after.

There are in this Kingdom many Vineyard Plots, the Wines of which have this bad Quality, and yet these are the Wines that are so much boasted of, which will not keep the Year without spoiling, if they were not preserved by ours, which have more of the Quality than they.

But if those, who put so great a Slight upon our Wines, should say we do not know how to make them, they would reason more justly than they do, when they would have us to believe that our Wines are not good, for they ought to allow that they are good in themselves, and we shall agree, that if there is any Fault in them, it is by Accident, since it only proceeds from the Manner of making it.

Then it must be said that the Wines of *Orleans* are good, but they make them ill, and then there is nothing more wanting, but to avoid the Faults in the Manner of making, and that is what I am going to treat of.

We have in this Plot of Vineyards so many different Sorts of Soils and Plants, that it would not be easy to give a Direction for the Manner of making the Wines from each of them; I can only say in the general, that in order to make good Wine, the Soil ought to be proper for the Vines, well exposed to the Sun, on a gentle Declension from the North to the South, rather dry than moist; that the Plants set there be of a good Kind, and well chosen; that the Vineyard be rather old than young, never dunged, or but very little, but rather earthed, and always well wrought, and in the proper Times to work them, and that the Grapes have a certain Degree of Ripeness before they be cut, and that they be tunned after they have been trodden, when one would make Wine that should have a Colour, and not for present drinking.

It is certain that when all these Things concur, it will be easy to make good Wine; but there are yet

other Things to be observed, of which I shall speak in the following Part of this Article.

They make in this Plot of Vineyards, as well as in many others, both Red Wine and White; I shall speak first of the Red, and afterwards of the White; of which there are a few Things to be said.

The best and most precious Wines of all that are made in this Plot of Vineyards, is the *Auvernat*. Of this there are six Species; viz. the *Auvernat Teint*, the Black, Red, Gray, and two Kinds of Whites; which are the white *Auvernat* of *Soler*, and that of the *Low Country*.

The *Auvernat Teint* is the reddest; and as it has always the Quality, it gives the Colour and the Body to the other *Auvernats*, and prevents them from growing ropy. And when it is mingled with the red only, they ought to let it remain in the Vat a little while; especially in those Years, that there is Reason to believe the Wine will take as much Colour as they would that it should have, or where it grows on a Soil where the Wine has always been accustomed to have Colour enough by being turned but a little.

Some pretend, that one Quart, or thereabouts of the Wine [*de Teint*] of the Tincture, or of [*gros Noir*] the large black, to a Vat of fifteen Puncheons of red *Auvernat*, will have a good Effect.

I own that it will give it a fine Colour, without rendering it harsh, provided it be not tunned too long; but as this *Teint*, or this *gros Noir*, have no Quality but that of giving it the Colour, I am of Opinion, that the *Auvernat Teint*, which is very red, substantial, and vinous, produces a better Effect; but it requires only to put more of that of the *Teint*, than of the *gros Noir*; because the *Auvernat* colours a great deal less than those two Kinds of Grapes.

The riper both the one and the other are, the more Wine they yield, and the more Colour they have; and for this Reason they ought never to be gathered, but when they are in their perfect Maturity.

The *Auvernat Teint* ought not to be planted indifferently in all Sorts of Land, because it will not do well in all; and for this Reason, those who would have them, ought at first to plant but a few, to see if they will succeed in their Lands. Also Care must be taken not to mix them with others in planting, that one may the better know what Quantity we should put into every Vat; which will be difficult to do, if they were planted confusedly with other *Auvernats*, or red Plants, to make thence good mixed Wine.

Although the *Auvernat Teint* is a very good Grape of itself, yet it must be owned, that if too much of it be put into the red *Auvernat*, it will alter the Quality of it; for the last Wine is never better than when it is made without any Mixture of other Grapes; and it has ordinarily as much Colour and Strength as it should have, not only to maintain itself by itself, but also to put off other Wines of an inferior Quality.

But then I suppose, that this red *Auvernat* grew upon good Lands; for there are some which of themselves do not give enough to the Wines that they produce; in this Case it is good to plant the *Auvernat Teint*.

It is true, that this Wine being mixed, will not be so

so fine, as if it were only the pure red *Auvernats*; but then again, it will maintain itself better; and when one would make an *Auvernats*, which has a strong Tartness, and a good Flavour, without having any Colour, you must put to the red *Auvernats*, about the seventh Part of the *Melior*, or of good white *Auvernats*, such as now grows in the Vineyards of *Blois*; but that one may be able to make this Mixture, it is necessary, that this *Melior*, or white *Auvernats*, be ripe at the same Time as the red *Auvernats*.

A Wine made after this Manner, is so excellent, and so disguised, that it is made to pass for pure *Burgundy* Wine; and is sold at *Paris* and other Places as such, in wicked Bottles. The best Wine Conners are there deceived every Day.

The *Auvernats*, without Distinction, is red; they also name it from its Skin, which is brown, because its Colour is not of so deep a red as that of the *Auvernats Teint*, and because it is deeper than the grey *Auvernats*, which is almost quite white, and that too when it has been tunned very much. This kind of red *Auvernats* is the most common among the black *Auvernats*, and one of the best Wines that grow in this Plot of Vineyards.

The [*Auvernats Noir*] black *Auvernats* is very uncommon in this Country, and known by few Persons; its Berry is rounder than the other *Auvernats*; its Skin is as black as Jet, and that is the only Thing that it is known by. There is also another Species of it, which some *Vignerons* call the *Auvernats of Tours*; it differs nothing from the red, but in that its Wood is very big as well as its Fruit. The Grape is long and well filled; and it were to be wished, that this Kind was not so scarce in this Country; for it is the finest, and one of the best that we have.

The gray *Auvernats* is neither white, black, nor red; but of a gray or Pearl Colour, when at the greatest Maturity. But some have made this Observation, that in certain Lands this Colour becomes black in about twelve or fifteen Years after the planting of these Vines; but nevertheless without losing their Quality. The Change of the Colour does not come universally. I have seen Vineyards very old, that did produce the *Auvernats* of this Quality.

When this gray *Auvernats* has been made off-hand, or when it has been tunned but a very little while, and it is once gone from this Vineyard Plot, and is denominated by a borrowed Name, it is an easy Matter to make it pass for such a Wine as is desired; whether it be sold as it is, or whether it be mingled with others of a higher Colour. But this Mixture must be made in such a Manner, that the Quantity of the gray *Auvernats* be not absorbed by the Red that is mixed with it.

Of making Wines in Orleans.

The Grapes being cut, and carried from the Vineyard to the Press, they tread them either in a Scuttle, which they place there, or in a Vat, when the gathering of the Vintage is finished; or, in fine, they cast them into a Trough of a Wine Press to be bruised. Also sometimes they carry them directly to the Press; but this is when they would make Wine fit for present drinking, and that it is not fermented in the Vat at all.

Those who make use of a Scuttle to bruise their Grapes, cannot possibly tread the Grapes well, or at

least they will be a long Time in doing it, and have a great deal more Trouble, in that they are obliged to raise up, with all their Strength, the Puncheons in which they tread the Grapes, to cast them into the Vat with the Marc, in order to work it all together.

The Manner of bruising the Grapes in the Vat when it is filled, is much worse than the first; in that, notwithstanding all the Precaution that can be taken, and whatever Time is allowed to endeavour to do this Work well, it is absolutely impossible it should succeed; for when the Wine has been tunned as much as it ought, and they have put it on the Press with its Marc, there will be a Part of the Grapes that have not been half bruised, and this causes the Marc to yield less Wine, and there is not all the Colour that it might have; and therefore the Grapes ought never to be bruised this Way, when it can be done otherwise.

But if this be a Loss to the Citizens, not to draw from the Marc all the Wine which it ought to yield, if all the Grapes had been well bruised; yet it affords an Advantage to the *Vignerons*, in that his Drink will be so much the better.

As there is an Inconvenience in treading the Grapes, either in a Scuttle, or a Vat, as I shall make it appear, it will be better to make use of a Wine Press; that is, without Contradiction the best Way to bruise the Grapes.

And besides, a Wine Press will serve for four Baskets, when the other will not serve for two, if they make use of a Scuttle; for according to the Measure that the Grapes are bruised in the Wine Press, the Wine falling into the Vat, does not rise above the Grape; by which it may be more easily known whether the Grapes have been well or ill trod before the Marc is turned into the Vat; or it is a great deal more easy to push it with the Foot, when the Trap Door of the Trough is lifted up, than to lift up the whole with bodily Strength, as they are obliged to do, when they tread in a Scuttle.

The Trough of the Press ought to be set in a Kind of Litter, and placed upon, or over the Vat; but when the Covering of the Structure, where the Press is, is low, it must be placed over the Middle of the Press without a Litter; then there will be little more Trouble, because it must be emptied into the Vat with a Bucket or Scuttle; but this is no great Matter, there are Hands enough to do this Work.

The Grapes having been trodden, as before, the Marc may be thrown into the Vat, either with the Grape and Skins, or separate the one from the other; this depends on the Manner after which one would make the Wine.

When it has been tunned a considerable Time, the Wine is less green, less subject to be ropy, and better for keeping, than if it were done off-hand, or fit for present drinking.

But if the Grape be tunned too much, it takes from it much of its Quality; because it leaves a Harshness, which renders it not fit for drinking for above a Year in certain Lands; and in others it never loses the Taste of the Grape Stone; and when with this Excess of the Vat, it has a Colour as red as Ox Blood, it is a Wine which

V I T

which they call *Grossier* or *Matin*; and it is commonly said it is better to keep than to drink.

When a Wine has this Fault, one cannot render it drinkable, but by mingling it with good dry new White Wine.

Then it is this Excess of the Vat, which renders our Wines hard, and makes them disesteemed without any Distinction, although all our Wines are not made after this Manner. But it is an easy Matter to avoid this Fault, which renders our Wines contemptible.

There are those who tun the Grape Stone with the Skin, and would give to their Wine only that Degree of the Vat, which it ought to have, and not to be strong, they draw it out from Time to Time by a Pipe, or by some little Hole which they make in the Vat, but this I do not approve of for Reasons to be given in the following Article.

Others make use of a Vine Prop, or some other Piece of Wood, which they thrust into the Vat, from whence they draw it out quick, and let it drop into a Glass where they examine if it have Colour enough, and if it makes a Circle or Scum, and boils and bubbles, which they call *faire le roue*: Others watch till the Marc is risen to such a Height, and make a Judgment by that.

As for myself, I am of the Opinion, that it would be a farer Way to thrust one's Hand a pretty Way into the Vat, (which I suppose to be raised, and to have been worked,) to take from thence a Handful of the Marc, and to put it to one's Nose, as the Dyers do, to judge of the Disposition of their Vats; then one may know if the Wine be made, and if it has Colour enough.

When it smells sweet, you should let it work a little longer in the Vat, until it has lost that Smell, and has a strong Scent that affects the Nose; then it ought to be taken; for one Quarter of an Hour at most is sufficient to force it.

A Wine taken in its proper Degree of the Vat, will never taste of the Grape Stone; it will be always fit to drink, and also will keep good for many Years.

I agree also, that the Wine that had been tunned too much, becomes tart and harsh, and that is what takes away its Quality; and as it is the Grape Stone, and not the Skin, that causes this Tartness and Harshness, the Means to prevent this Inconvenience is, in being very careful as to the Decree of the Vat that is given to the Wine.

But as one may often be deceived in giving it too much or too little of the Vat, I think the surest Way would be, to stone the Grapes when they are trampled, before they are put into the Vat.

This Work would not be so much Trouble as it may be imagined; for one Stoner would suffice to employ one Treader, let him tread as fast as he can.

When the Grapes are bruised in a Wine Press, several may employ themselves in stoning. One Method of doing it is, to put them into a Basket plated, &c. about six Feet long, four Feet broad, and ten or twelve Inches high; and that this may not be any Incumbrance, it may be placed about the Middle of the Press, and have two Men to sift and separate the Skins from the Grape Stones.

V I T

I find that a Cribble is much more convenient; for it takes up less Room, and there needs but one Man to work above; and the Work will be as easily, or more easily done.

I have seen many of these Cribbles; but that which I am going to describe, appears to me to be the most commodious.

The Cribble for stoning the Grapes ought to be made with Brass Wire; because this is more pliant, and does not rust so much, and lasts longer than Iron Wire. The Holes ought to be an Inch in Breadth, almost of an octagonal Figure; it is worked upon two Hoops joined together, the one upon the other; and when it is finished, it is to be covered with a third Hoop or Band, that is about four Inches high.

As the Marc is falling in by the Wine being pressed out, and is risen to the Height of the Cribble, they put under to support it, a Band of Wood, or little Hoop, two or three Fingers high, which goes round at the Bottom of the Cribble; and besides this, four round Iron Bars of the Thickness of a little Finger; because if they were broad, the Skins of the Grapes would rest there, which would hinder the other from passing.

It is proper to put these Iron Bars in such a Manner, that two of the four may sustain the other two, and that they may be all of one Length.

The Ends ought to cross the two Hoops, and to cover the third; and they must be joined to many Places of the Trelase of Brass Wire, which may be double or treble.

The Wood of the Hoop ought to be notched in two Places over against one another, and about an Inch in Depth, and three in Breadth, according to that of the Staves upon which it is to be placed; and these Staves should be placed upon a Scuttle resting upon the Vat, upon which they tread the Grapes.

It is also proper that these Notches be plated with Iron, and that they have two Handles or Grasps of Iron, pretty thick and round, to prevent the hurting the Hands of him that manages the Cribble, because it is weighty, and there is often Occasion to remove it from Place to Place.

This Cribble may be about a Foot in Height, eight or nine in Circumference, and an Inch in Thickness at the Top, and something more at the Bottom; because of a Band of Wood that is placed round about to sustain the Trelase, as I have said before.

The Treader having bruised the Grapes, instead of pushing the Mass in the Vat with his Foot, as is done when he would tun the Grapes with the Skin, it is taken either with a Bowl, or a Pail, or with the Hand, and put into the Cribble; then the Stoner separates the Marc as well as he can, the Skin from the Stone, and casts the latter into a Vessel that stands near him; and when that is filled with the Grapes, they carry it to the Middle of the Press in a Pail, or in a Basket, and from Time to Time empty into the Vat, the Skins and the Wine which are in the Vessel, which has been stoned.

The Business of the Vintage Gatherers being finished, they put the Marc and all the Stones that are upon the Middle, and they lower the Plank to draw from thence the Wine that is found there.

Some

Some give it another bruising, but I believe very unprofitably; for that cannot get out much Wine; and also that which they get from these Stones has nothing but a Harshness; but nevertheless one may, because there is a little of it, mingle it with the other, that is in the Vat.

One Marc of Grapes, which one may reckon ten *Poinçons*, may yield about fifty Pints of Wine, or thereabouts. This depends upon the Size of the Grapes, and the Heat which has been during the Time of the Vintage gathering.

The Wine being boiled with its Skin, it will be necessary to observe, from Time to Time, if it have Colour enough; and if it be sufficiently made, to be drawn off; and when it is found that it is not yet red enough, the Marc must be thrust down in the Vat in order to give it the Colour, and never to be forced; you may also cover the Vat with a coarse linen Cloth double, and put the Board of the Press upon that, in Case one is apprehensive, that it will lose a Part of its Strength.

It is not the same, when the Stone is left and put into the Tun with the Wine, because then it will easily force; whereas this Inconvenience never happens when the Grapes have been stoned; for this Reason it ought always to be done; one is sure to have Wine well made, and such as may be kept many Years without spoiling, according to the Time that has been left to ferment.

And if all our red Wines were made in this Manner, we should not have Occasion to say, as it hath been said for a long Time, that our Wines are harsh and coarse, for it must be agreed, that it is nothing but the Stone that gives it this bad Quality; which is however accidental, since I have offered a Method to remedy it, which may easily be put in Practice.

Many Citizens complain, that the Merchants will not give a greater Price for the Wine whose Grapes have been stoned, than for that which has not; but in the mean Time, it is better; it does indeed, cost something more in making it after this Manner, in that it takes up more Time in pressing.

Upon this Account many Citizens have discontinued the stoning their Grapes; but I do not approve of that; we ought to spare nothing to make good Wine; and I am persuaded that there will always be found Merchants reasonable enough to make a Distinction between a Wine, the Grapes of which have been stoned, and that which has not, not only by their Taste, but in the Price too.

As the Grapes that are fermented without their Stoner are subject to grow ropy, it is good to prevent this Inconvenience in gathering them before they come to their full Maturity, and to give them but little Fermentation; it can then never be too thick; because the Grape-Stone not being there, it is impossible it should force it.

During the Time that the Wine is working in the Vat, one may pierce the Casks, and put into each of them about a Pint of Water; it should be boiling hot, or at least very hot; this will purify the Vessels, and render them more tight.

The Hole of the Bung being well stopped, as soon

as the hot Water has been put in, it should be shaken and turned on all Sides, to be able to see if it has Vent in any Place.

Some pretend, that this hot Water will take away the Taste of the Casks; but I very much doubt of this.

In order to make this Experiment, it is requisite, that one be first sure that the Casks have any bad Taste.

When the Casks have been seasoned and drained as dry as may be, they must be placed upon the Stilliers, and there set firm with Stones, or some other Thing, to hinder them from rolling while they are filling.

The Basket that is hung up by means of a Prop to receive and hold the Grapes and Skins which fall from the Middle of the Press into the wooden Pipe ought to be well closed up to hinder the Stones from going into the Casks when they are filling; because when the Wine boils, it casts out the Scum, Lee, Skins, and Stones, in order to purify itself; and sometimes a small Quantity of these is sufficient to stop entirely the Holes of the Casks.

But to prevent this Accident, one may nail, at the small Hole, at which the Wine runs down, a small Lattice of Brass Wire, the Holes of which must be very fine; then there would but a few of the Skins pass, and no Stones; and the Basket, which is very troublesome when one would empty the Pipe, would be useless.

One may yet, for the greater Security, have another Grate, and fasten it with Nails, above the Socket on the Inside of the Funnel; but this Grate must be raised three or four Fingers, to the End that the Skins may not hinder the Wine from passing.

Before the Marc is begun to be put upon the Middle of the Press, I suppose the Press to be in such Condition, that nothing is wanting of all the Utensils that is necessary, for it would be an Imprudence to have, at this very Moment, any Thing wanting that is necessary for the making a Marc.

The Screw being the most brittle and most necessary Part belonging to a Press, a Master ought always to have one in reserve, ready to put in, in case of Need.

In like Manner the Feet of the Beams should be examined some Time before the Vintage, that they be not rotten, for that is the Place the commonly fail in; and when this happens, it is not so easy to remedy it as it is to remedy a broken Screw.

In order to make the Beams of a Press last a long Time, when they are good of themselves, it ought to be so contrived, that they may always have the Air under the Middle of the Press; especially at the End of these Pieces, there ought not to be either any Marc or Earth, and therefore it should be hindered from falling there.

Some make a small Piece of Brick Work round each of these Beams: and that is the best Precaution that can be taken to make them last a long Time.

After the Press has been put in Order, and the Wine has had its Degree or Time in the Vat that it ought to have, or they can give it, it must be put upon the Middle of the Press.

When it is at a great Distance from the Vat, they make use of a Scuttle or Basket, or if it be near, of a Pail; which they let drain upon a Board, which bears

at one End upon the Vat, where it is fastened with a Nail, or other Thing, and the other upon the Middle of the Press; this Board should be bordered on both Sides with Ledges, strait and well joined, and about an Inch in Height, to hinder what drains out of the Basket from running on the Ground.

A Piece of Wood, with a Hollow or Channel about an Inch deep, would be much better than this Board with Ledges, for they cannot be with Ease so closely joined, but that the Wine will find some Chinks to run out at, which will not be in the Wood thus hollowed.

Some, in order to empty their Vats the more easily, put in a Pipe, through which they draw the Wine clear through a little bucking Tub made for this Purpose; out of which they take the Wine in a Pale or Pannier, to empty it into the Casks.

For this Purpose the Vat must be set high on a Stilling or Gauntry; and the Earth hollowed at the Place where the Pipe is placed.

Before the Wine is drawn off clear, you must always begin to keep off the Cover of the Vat, in order to prevent the Wine from forcing; and this must be done in such a Manner, that he who empties has not the Trouble of lifting it up so high to put it in the Scuttle.

I own that this Manner of emptying a Vat is very commodious, and shall, in the following Article, speak of the Inconveniency that may happen thence.

The Marc being placed on the Middle of the Press, they cover it with a Board, with Bolsters, Cushions, and Bags or Pillows. There must be two Rows of these last, and sometimes three, when the Marc is thin, because how much less the Screw appears, by so much less is it in Danger of breaking; and as the Marc shall be thick, according as they have ordered it, there must be some Rows of the Bags retrenched; for it is sufficient, that there is a certain Distance between the Wheel and the Screw, which would not be so, if the Marc were very thick, or there were many Sacks.

There is no need to put the Ring of the Rope into the Hook, before the Wheel has been lowered on the Bags, and that you have examined if all is made even, and that none of the Bags are removed.

Before you begin to lower the Wheel upon the Bags, the Screw ought to be well greased above the Nut of it, and also below, when it touches the Bags.

They also grease that Part of the Screw that was within the Nut Screw before they have brought it down to the Point where it ought to be; for the first Operation after the Plank of the Axle-tree has been let down, and before the Loosening, the Screw must be soaped on the Places where it has had none.

White dry Soap without Oil is the best for greasing the Screw, for when Oil is mingled with the Soap, that draws the Rats, which gnaw the Screw, and it occasions a Gum, or thick Substance, which makes it go hard when they press the Marc.

The Trendle ought also to be placed at a reasonable Distance from the Middle of the Press upon the Nave of the Wheel, and being well rubbed with Hog's Lard, the Trendle will turn the better. Others make use of an Iron Crow, which at least produces as good an Effect as the Nave.

When the Staves or Rammers are rather long than

short, and that the Trendle is pierced with a Height agreeable to a Man of a middle Stature, they will have the more Force to press the Marc.

After the Plank has been let down, and the Troughs filled to a Pannier or thereabouts, and they have afterwards added the Wine that comes from these Pressings, they give the first Squeezing, which ought to be followed by three others in a short Time, because the *Auvernat* having in it much Fire, its Marc would dry quickly, and yield much less Wine, if there were much Time between these Pressings.

It is not enough to grease the Screw of the Press the first Operation, before the Balance is let down, when it is a Wheel Press; it ought to be done from Time to Time, especially when the Screw is perceived to be rough, or screams in the Nut when the Trendle is turned.

Some, before they give the Marc the last Operation, *barbager*; that is to say, they work it, or prick it with an Instrument of Iron, but without touching the Sides, because they choose to hinder it from falling on the Middle. They pretend that this little Squeezing makes the Marc yield about two Pints of Wine the Puncheon.

I have never made the Experiment, but this is seldom practised but in the Marcs of white Wine, because they are thicker, and not so hot by much as those of *Auvernat*.

The last Operation or Pressing being given, you may wait twelve or fifteen Hours for taking off the Marc, that it may have Time to drain, and they seldom do it sooner, except they want the Press for making other Wine.

Although the Wine that comes out of one Vat is the same, yet they give it two different Names; they one they call *unpressed Wine*, and the other the *Wine of the Press*.

The first is that which comes from the red or white Grapes, when they have been trod, whether they have been tunned or not, and the second is that which comes from the Marc after the Pressing. As this last has always a great deal more Colour and Harshness than the first, they mix them together, to the End that they may make an equal Wine, and if they do not do this, they would have one Part of the Wine of the same Vat too delicate and weak in Colour, and the other too red, and too harsh, which would not be fit for the Merchants, who are for an equal Wine.

When I say the Wine should be equal, I mean only that of one Vat, and not of one whole Cellar, for as all the Wine that one buys cannot be all spent at the same Time; and that the Merchants search sometimes for Wine high-coloured, and a little firm, and sometimes for a Wine more delicate and fit for present Drinking, therefore it is, in my Opinion, the Prudence of a Citizen to have Tuns of different Degrees of Colour and Firmness, that the more delicate may be first drank, and the firmest some Time after, or the Year following, for most Persons love old Wine better than new.

But it is yet more advantageous for a Citizen to have Wine that is rather a little firm than too delicate, because, if that be not sold quickly, it may grow ropy, or be spoiled, when, on the other hand, that which is well

well mixed will keep a great while, and he may sell it a long Time after.

It is true the Merchants often slight, or rather seem to slight and reject, a Wine that has been but little fermented; but it is very often nothing but a little Chicane that those make use of who are employed to purchase Wines to buy them the cheaper; therefore we must give them leave to say what they will; but always give the Wine something of the Tun; because, if it be not sold at first, it will at last; whereas, when it is made for present Drinking, it must be sold as soon as may be, and perhaps under Price.

Some Persons, out of Thriftiness, or rather fardid Covetousness, fearing to lose a little Wine, never entirely fill their Casks till the Wine has cast forth its greatest Fire; that is, they will not make it boil till it has no Force left; and there being only one Pannier full of Wine put into the Cask the next Day, or two Days after it has been filled, that has not the Force to warm it again sufficiently to make it boil.

This Way of managing Wine is very wrong; for it causes all its Excrement to remain at the Bottom of the Cask, which augments the Lee, and often contributes to the spoiling the Wine, and to keep it for a long Time foul, which therefore the Merchants reject.

It would be much better to fill it presently up to the Bung with the Pressurage, or with what has been pressed, which is taken from the Pressings that they give to the Marc, because the Casks being always full, the Wine purifies itself the more, and becomes clear in less Time, and of consequence is more palatable, and may be sooner sold.

It is not enough to fill the Casks up to the Bung the first Time that the Wine is put into them; they ought to be refilled many Times; that is to say, as soon as the Boiling is over, Wine must be put in to excite it to boil, and the same Thing is to be done the next Day, and afterwards for eight or ten Days every other Day.

The Necessity there is of filling the Casks as soon as the new Wine has been put in them, is proved by the Accident that happened to the Wines in the Year 1718, when the Season was too hot and dry during the Months of *July* and *August*.

The Wines were then so extreme hot as to boil very low in the Casks, so that many, who had neglected to fill them at first up to the Bung, had their Wines turned sour, which did not happen to those who had used the Precaution of filling them to the Bung, and keeping them full; and for this Reason, those who have many Tuns of Wine ought always to take of the last they have made to fill all those Puncheons of the other Tuns, and when a Person has but one, he must put Wine in a Cask called a *Gurultbée*, to fill those Puncheons as far as the Bung, as soon as the Wine has done boiling; then the Wine that remains must be put into the Casks of *Gurultbée*, or into a very close Vessel, for fear of its evaporating or losing its Spirit.

I will say, by the by, that many deceive themselves in making Wine these hot Years; for they let it ferment but a little, because it boils as soon as it is trod, but this is but a false Boiling which comes rather from the Fire that is in the Grape, than from the working in the

Tun, therefore it ought to be tunned a considerable Time. It is in such Years the Grapes should the rather be stoned, and the Wine sufficiently fermented.

It is true there is some Inconvenience in filling the Casks up to the Bung the first Time the Wine is put in, because it is impossible not to lose some of it; for it will mix with the Scum and the Lee which come out at the Bung, but this Inconvenience may be remedied by setting Gutters above the Bung, and Pans or Vessels of Wood under the Gutters, to receive all that which comes out.

And whereas some pretend, that Lead communicates an ill Taste to the Wine, it is the surest Way to have them of Pewter, in such Manner, that nothing but the End of the Socket may enter into the Hole of the Bung, for if the Hole be made large so that the Socket may play within it, the Gutter will be useless, because the Wine would run out between the Wood and the Socket.

There must also be a Vessel called *Gurultbée* to empty these Vessels in as they fill, and it should be covered with a thick double Linen Cloth, and closed and fastened all round about with a Hoop to hinder the Wine from growing flat.

The Lee descends by little and little to the Bottom of the Casks, where it is joined with the Scum which there falls together, and is incorporated with it.

Some Days after, the Wine being grown clear, they empty the Vessel, and the Lee remains at the Bottom. This Wine may be put in a Vessel by itself, without mixing with the Wine which is in the Casks out of which it came. Some say this collected Wine is the more fine and strong, and others say the contrary; but they may say what they will, for it is always true that this Wine is very good, provided it has been kept very close in the Vessel where it was collected.

And I believe that one might, without any Scruple, make use of it for filling the Wine; but, as to this, you need not consult either the Merchants, or the *Vignerons*, since the one has not Judgement or Sincerity enough, and the other are too much interested; and I speak with a Knowledge of the Matter, founded on the Experience I have had many Times, and without any Interest but that of the Publick.

Those who, from a covetous Temper, will not be at the Charge of procuring these Gutters and Vessels to receive the Wine of the Casks while they are boiling, have no Skill in it; for the Wine, which they would save by this Means, would make amends entirely the first Year for the Expence they would be at in procuring them.

Others that are afraid that they shall not sell their Wine, say that the Merchants have always an Opinion in Favour of that Wine, of which the two Sides of the Bung of each Cask are filled with Scum as far as the first Bands or Circles, and that they have a quite contrary Opinion of those where it does not appear.

It is true that formerly they did mind this, and their Opinion might be well grounded, because they never made use of these Gutters; but at this Time their Opinion is altered, for they are persuaded that these Gutters being in Use, a Cask may have cast out all the Scum without its appearing at the Sides of the

Bung, because it falls into these Vessels that are set to receive it, and likewise that all the Wine that is there, is well mixed.

Besides, it is an easy Matter for a Merchant to know if there be much Lee in the Cask, for he needs only to pierce it into the Lee, that is to say, at the Bottom, about two Fingers of the Notch of the Cask where the Head Pieces come in.

The Wine having cast out all its Scum, it will be proper to taste all the Casks into which it has been put; to the end that, if any one be found that has a bad Relish, those who have purchased them may be apprised of it, that they may put all the bad ones to their own Account.

Some say that St. Martin's Day being passed, you cannot oblige the Merchants, who have purchased the Wine, to take that again which has been spoiled in the Casks, because they say it is the more difficult to remedy it. Others pretend that the Merchants are answerable three Months after the Casks have been filled, provided they have not been removed from off the Stillings.

When the Wine has done boiling, it must be covered with the largest Side of the Bung to hinder it from evaporating; and eight or ten Days afterwards it must be filled full, and bunged up.

Some make use of Bungs about half a Foot long, because they can take them out without daubing the Casks with the Scum, but I am of Opinion that broad Bungs are better, and to make two Holes on the Side, the one about the Bigness of a little Faucet, the other about the Bigness of one's little Finger, that a Pewter Funnel may be put in, having in it a Piece of Pewter foldered about two Inches from the End, the Holes of which may be as big again as those of a Tobacco Grater; to the end that, when one uses it to fill the Casks, neither Stone, nor Skin, nor Kernels, nor Lee, may pass. The great Hole serves for the putting in of a Funnel, and the other to give Vent for the Casks during the Time the Wine is pouring in them.

The little Hole ought to be made at the Time that the Casks are bored, to put in the Wine with the great wooden Funnel, for if the Socket exactly fills the Bung Hole, the Cask would fill very slowly, if it had not Vent given it by the little Hole.

When it is done after this Manner, the Tuns are not daubed with the Scum. It is not disturbed, as is done in striking to beat in the Bung, and the Wine will have less Vent.

You must be sure to fill the Wine every fifteen Days after it has been bunged, until towards St. Andrew's Day; you are not to meddle with it any longer, till after the Severity of the Winter is over, which commonly happens towards the Middle of February, because the Frost may make it swell.

The *Auvernat* is not the only red Wine that we have in this Vineyard Plot; there are also other Wines made, that have the same Colour, but are of a different Quality.

There is, for Example, the *bon Lignage*, or the good Wine; and that which is made of all Sorts of Grapes. As to the first, it is made up of the red *Auvernat*, the *Taint*, the Gray, the White, the tender

Samoireau, the *Melier*, and all the best Sorts of red Grapes.

The second is composed of all Sorts of Grapes, good and bad, but more of the latter than the former, whence it is easy to be comprehended, why the one has less of the Quality than the other. And as this second is generally spent in the Country, they make it all Manner of Ways, either fit for present Drinking, or firm, or hard, according to the Occasion they have for it, and the Quantity they are to provide. As to the other, they do not fail to make it, and often send it to *Paris*.

All these Sorts of Grapes are not gathered with the same Care as the red *Auvernat*, which cannot bear the Water, nevertheless the Wine is the better, when the Grapes, with which it is made, are cut in a Season that is rather hot and dry than cold and moist.

We have, in some Places of this Vineyard Plot, three Sorts of red Wines, bearing the same Name, which, nevertheless, they distinguish the one from the other. There is the tender *Samoireau*, the hard, and the *Fourchu*, which have all three different Qualities.

The tender *Samoireau* does very well in the Lands of the *Olivet*, *St. Mesmin*, and *Clery*, where it is more plentiful than any where else. They make of it a particular Wine which will keep a long Time, provided it have no Mixture, and that they give it but little of the Vat; this renders it firm, and prevents it from growing ropy.

This Grape may be mixed with the red *Auvernat*, because they both ripen at the same Time. The *Samoireau* gives the Colour to the *Auvernat*; it sustains it, and causes it to keep a long Time, but you must put but a small Quantity, for fear of altering or entirely absorbing the Quality of the *Auvernat*, which after it has lost, it also loses its Name, and is no more regarded, but as a good *Vin de Lignage*, or one composed of all Sorts of Grapes, which is vulgarly called *Vignerons Auvernat*, very different from that of the Citizens, which is in a Manner pure *Auvernat*. When one would render this *Vin de Lignage* yet better, he may put to it a fourth Part of good *Melier*.

The hard *Samoireau* is a little higher coloured than the tender. When it has but its proper Degree of the Vat, they may mix one or two Puncheons of White, and a little less, when they turn it; they should also, when it may be done, take a *Melier* of a better Kind, for this Wine has not much Fire. When it is pure, and it has passed the Year, that Quality diminisheth: it is then proper to make use of Rapes, not of Chips or Shavings, but of Corn, without putting Grapes to it, as some do, for that renders it hard and disagreeable to drink.

It is sufficient to put a third Part, or at most a Half, of the Grains into the Puncheons, and after that they fill the Wine up to the Bung. They make use of these Rapes to put off the Grounds or Bottoms of Wine, and the weak Wines, which they also mix sometimes with them. The third Kind of *Samoireau*, of which I shall speak, renders them the better for keeping.

The *Samoireau Fourchu* is the best of the three Kinds; this is proper to give the Colour to the others, and to sustain those that are weak, and to restore those that have any Defect.

In order to know the Colour, they cast some of it against a Wall, and, according to the Impression it makes, they judge of the Effect it will produce.

One single Puncheon of that will colour six of White, and sometimes more, according as the Seasons are hot, and the Quantity of the Wine that the Vineyard has yielded; this Wine is not only good to drink, when it is taken in Time, but it serves for a Remedy against the Dysentery and other Maladies; its Marc is good against Rheumatisms.

This Sort has a Virtue that is not found in any others, because the longer it is kept, the better it is, for it is better for drinking at the End of twelve or fourteen Years, than one or two Years after it has been made.

Some put it in Bottles, but it keeps equally as well in Casks, provided Care be taken to keep them always full, and to observe that the Casks do not want Hoops, and it will be proper to put on several Iron Hoops at each End.

The Wine, the Marc, and the Wood, or rather the Ashes of this Plant, have also a great many other Properties which I shall not relate.

The Time of gathering these two species of *Samoireau* comes much later than those of the first, which ripens at the same Time with the *Auvernat*.

The Territory of *Mardic* is the most proper for these Plants, and that which produces the most of it (I mean of the hard and *Fourchu Samoireau*); there is of it at *Bou* and *Cbeci*, and but a very little in any other Places of this Vineyard Plot.

As the *Fourchu* never produces more Wine than when it is a little old, many, eager to enjoy the Fruit of their Labours, and their Expences, have not Patience to wait so long, and therefore they pull up those of them they had, and cannot resolve to plant them when they have them not.

Nevertheless this is a precious Plant, and one may judge of it by the Effects that it produces, and by the Price which it bears, for it is commonly sold for double the Price of the best Wines of this Country; and I do not know but that those, who destroy them, and those that do not raise them, will repent it one Time or other.

As there is not much to be said of the Manner of making White Wine, and having taken Notice of it at the Beginning of this Article, I shall say but little of it particularly.

Although there are many Kinds of white Grapes, yet they make, as one may say, but two Sorts of Wine of them, the one the moist, and the other the dry Wine.

The first, such as the *Muscat* or the *Gendin* of *St. Mesmin*, those of *Mariguy*, of *Rebrechein*, and other neighbouring Places, may be looked upon as the most precious, in that they bring the Money into the Kingdom, rather than the dry Wines, for they send them into *Holland*, *Flanders*, *England*, &c. To render this Wine the better, they do not content themselves to see, that the Grapes have their perfect Maturity, and be half rotten; they wait oftentimes till the Frost has taken them, to have the Wine which the call *Bourou*, and in some Years they defer the Vintage until the fifteenth or twentieth of *November*, and it is then sometimes so

cold, that the Icicles hang upon those Grapes that perished, so that they are obliged to carry Fires into the Vineyards in great Pans, to warm the Gatherers.

It is true that those, who tarry so long before they gather, have a great deal less Wine than the others, but then at the same Time it is much better, and sells a great deal dearer, so that I believe it comes much to the same, or very near the Matter.

The Wines of which I am speaking, although sweet of themselves, have, nevertheless, not always the same Degree of Liquor; this depends upon the Condition of the Season, that is to say, by how much the Summer and Autumn are the hotter, the Wine has the more Liquor, and it has a great deal less, when the Season is the Contrary.

What I say is so true, that the Season having been very hot in the Year 1719, the sweet Wines themselves had Abundance more Liquor than ordinary, and kept good more than a Year; also the dry Wines of many Places were sweet and clear.

Some red Wines were also very soft (which is very rare), and held good till the Month of *February* in the Year 1721. It is true they were thick, and that they did not become clear till the Time that they lost their Sweetness, which altered their Strength.

The softness of the white Wines being over, they were nevertheless good, but as there remains a certain Flavour, which pleases the Palate of most Persons, it is best to sell them, and spend them as soon as may be.

One may know by Experience that good Grapes almost always make good Wine. Among the white Grapes, without Contradiction, the best are *Melior*, and the white *Auvernat* of the *Low Countries*. As the white *Formentes* or *Bourgignons*, the *Maledueux*, the *Tramboises*, the white *Gois*, &c. make a Wine which is better to throw away than to drink, yet Vineyards of the *Vignerons* are stuffed with these wretched Vines, because they yield more Wine, and, for the most part, better resist those Accidents that happen to a Vineyard, for these People have no regard to any Thing but the Quantity, which is the Reason that they do not ordinarily sell their Wines to that Advantage as the Citizens do.

The white Grapes cannot be gathered too ripe, because the riper they are, the more Wine they produce, and their Rottenness does not give it any bad Taste, but when it is begun before they come to their full Ripeness, they are subject to grow yellow, yet Regard is to be had to those Lands of which the Wine is subject to grow rosy.

For this Reason, when they are gathered, it is good that the Grape has a little Greeness, to the end that the Wine that comes from them may be able to keep dry, to which the white *Auvernat* of the *Low Countries*, and the green *Melior*, contribute very much; the last hinders the Wine from being rosy, and the first makes it clear, and for this Reason it is good to plant of it with the *Melior*, because, at the Time of gathering, they may be both mingled together, and make a Wine without any Fault.

One ought to endeavour not to gather the Wine but when the Weather is fair; a rainy Season is not so favourable, for one ought never to mingle Water with the Wine that one makes, though some are not over-

scrupulous as to this Point. It is true, the Inconvenience is not so great in respect to the *Auvernats*, but that should not hinder one from always endeavouring to make good Wine, and for this Reason it is best to gather the Vintage in a dry hot Time.

As the White Wine is not tunned, when they bring the Grapes in Panniers from the Vineyards, they empty them directly on the Middle of the Press, where they trample them with their wooden Shoes; the broadest and smoothest are the most proper for this Work.

The Grapes ought to be trod immediately, that is to say, every Pannier as they bring them from the Vineyard, otherwise the Wine would be yellow, and this Colour is disagreeable to the Sight, and still more to the Palate, and consequently gives the Wine a bad Quality.

According as the Grapes are pressed on the Middle, and that the Pipe fills, they empty it to fill the Puncheons, or the Quarter Puncheons, to a Pail full, or thereabouts, according to the Largeness of the Cask wherein it is put; to make it boil, they fill them up to the Hole of the Bung with the Wine which comes from the two first Pressings, and that which remained in the Pipe before they gave the two first Squeezings, and that which the others yield, serve to put into the Wine, when the first Boiling begins to be diminished.

One ought always to give to the Marc, whether it be white or red, four Pressings, without taking in the Lowering of the Beam, that is to say, that it ought to be cut four Times.

Some give it the third Working with an Iron Grapple in the Middle of the Marc, and they leave all round about half a Foot in Breadth, to keep in that which is wrought, and at the fourth Pressing they cut the Border that they left, and put it back upon the other.

They pretend that a Marc so ordered yields the more Wine. As the Marc of White Wine is the more thick, and has less Fire than the *Auvernat*, it does not dry so soon; for this Reason, there ought to be longer Times between the Squeezings.

They give them these commonly in the Night Time, because they do not lower the Beam, but when the Day's Work is finished, when the Men who are to work the Marc have supped.

When the White Wine is cold, it must be filled up and bunged, and kept always full, at least if it be not in the Depth of Winter, for when this Kind of Wine is emptied, it becomes yellow in most Countries, but when this happens, it is easily remedied, either by stirring it with a Stick of Hazel cleft into four, which is put in at the Bung Hole, or in shaking briskly the Puncheon, which they leave sometimes on the Bung, to the end that the Lee that descends thither, and afterwards is mixed again when the Cask is turned up, may take away the Yellowness.

The second Method seems to be the best, for besides that the Wine does not take Wind, it is also done in a great deal less Time, for one is not obliged to unbung and bung again every Cask, for they may be filled up with a small Tin Funnel.

For some Years last past they have made Rapes of White Wines, from which they do not reap any great Advantage; they make use of them to mix with the

coarse, harsh, red Wines, that have but little of the Quality. In the mean Time, this fits the meaner Sort of People, who have not a very nice Taste; in that it pleases their Palates, and is sold cheap.

It will not be to any Purpose to name the Places of this Plot of Vineyards, which produce the best White Wines, for the Merchants do not take the pains to make a Distinction between the Wines which have much of the Quality, from others that have less; besides, they are many Times deceived, for some Citizens, who have a great many Houses of Wines in different Places, after the Vintage is over, send that Wine they have made in one lesser Vintage to be added to that of another that is much better, and so a Merchant thinks that all the Wine he buys is from the same Place, when it is not.

I do not approve of this Practice of the Citizens, for a Merchant, who would have Wine of one certain Place, will not be prepared to manage that which he shall have from another, because those different Wines will not produce the same Effects, with the Management he shall use to them, and no Person ought to be deceived.

When the Vintage, either of red or white Wines, is finished, the Press ought to be taken care of, that the Rats do not gnaw the Screw of it. It should be rubbed with Garlick, the Smell of which those Animals cannot endure; it is also good to cover it with some old Casks, to hinder any Filth from falling on the Screw, which cannot be kept too clean.

Of Vineyards in England.

There have of late Years been but very few Vineyards in *England*, though they were formerly very common, as may be gathered from the several Places in divers Parts of *England*, which yet retain that Name, as also from ancient Records, which testify the Quantities of Ground which were allotted for Vineyards, to Abbeys and Monasteries, for Wine for the Use of the Inhabitants; but as to the Quality of the Wines which were then produced in *England*, we are at present ignorant; and how these Vineyards were rooted up, and became so generally neglected, we have no very good Accounts left. Whatever might be the Cause of this total Neglect in cultivating Vines in *England*, I will not pretend to determine, but such was the Prejudice most People conceived to any Attempts of producing Wine in *England*, that, for some Ages past, every Trial of that Kind has been ridiculed by the Generality of People, and at this Day very few Persons will believe it possible to be effected.

Indeed if we judge only by the Success of some modern Essays made near *London*, where small Vineyards have been planted a few Years past, there would be no great Encouragement to begin a Work of this Kind, because the Produce of very few of these Vineyards has been so kindly as were to be wished, but however, this should not deter others from making farther Trials, especially when they consider the many Disadvantages, which most or all of these Plantations, which have been made, were attended with, for first there is scarce one of them placed upon a proper Soil and Situation for this Purpose, and secondly, there is not one which is rightly planted and managed, as I shall presently shew, and

and how can we expect Success from Vineyards under these Disadvantages, when even in *France* or *Italy* they would succeed little better, if their Management were not directed with more Judgment? I shall therefore humbly offer my Opinion, which is founded upon some Trials I have seen made, and from the Instructions that I have received from several curious Persons Abroad, who cultivate Vineyards for their own Use, and that of their Friends, and who have been very exact in observing the several Methods of Practice amongst the *Vignerons* of those Countries, from whence it is hoped that the Prejudice, which most People have against a Project of this Kind, will either be removed, or at least suspended, until Trials have been judiciously made of this Affair.

The first and great Things to be considered in planting Vineyards is the Choice of Soils and Situations, which, if not rightly chosen, there will be little Hopes of Success, for upon this the whole Affair greatly depends. The best Soil for a Vineyard in *England* is such, whose Surface is a light sandy Loam, and not above a Foot and a Half or two Feet deep above the Gravel or Chalk, either of which Bottoms are equally good for Vines, but if the Soil is deep, or the Bottom either Clay, or a strong Loam, it is by no means proper for this Purpose, for although the Vines may shoot vigorously, and produce a great Quantity of Grapes, yet these will be later ripe, fuller of Moisture, and so consequently their Juice not mature, nor well digested, but will abound with Crudity, which in fermenting will render the Wine sour and ill tasted, which is the common Complaint of those who have made Wine in *England*.

Nor is a very rich, light, deep Soil, such as is commonly found near *London*, proper for this Purpose because the Roots of these Vines will be enticed down too deep to receive the Influences of Sun and Air, and hereby will take in much crude Nourishment, whereby the Fruit will be rendered less valuable, and be later ripe, which is of ill Consequence to these Fruits, which are known to imbibe a great Share of their Nourishment from the Air, which, if replete with Moisture (as is commonly the Case in Autumn,) must necessarily contribute greatly to render the Juices less perfect, therefore great Attention should be had to the Nature of the Soil upon which they are planted.

The next Thing necessary to be considered is the Situation of the Place, which, if possible, should be on the North Side of a River, upon an Elevation inclining to the South, with a small gradual Descent, that the Moisture may the better drain off, but if the Ground slopes too much, it is by no Means proper for this Purpose; but if, at a Distance from this Place, there are larger Hills, which defend it from the North and North West Wind, it will be of great Service, because hereby the Sun's Rays will be reflected with a greater Force, and the cold Winds, being kept off, will render the Situation very warm. Add to this, a chalky Surface; which if those Hills do abound with (as there are many such Situations in *England*;) it will still add to the Heat of the Place, by reflecting a greater Quantity of the Sun's Rays.

The Country about this should be open and hilly,

for if it be much planted, or low and boggy, the Air will constantly be filled with moist Particles, occasioned by the plentiful Perspiration of the Trees, or the Exhalations from the adjoining Marshes, whereby the Fruit will be greatly prejudiced (as was before observed.) These Vineyards should always be open to the East, that the Morning Sun may come on them to dry off the Moisture of the Night early, which, by lying too long upon the Vines, greatly retards the Ripening of their Fruit, and renders it crude and ill tasted. And since the Fruit of Vines are rarely ever injured by easterly Winds, there will be no Reason to apprehend any Danger from such a Situation, the South West, North West, and North Winds being the most injurious to Vineyards in *England* (as indeed they are to most other Fruit,) so that, if possible, they should be sheltered therefrom.

Having made choice of a Soil and Situation proper for this Purpose, the next Thing to be done is, to prepare it for planting. In doing of which the following Method should be observed: In the Spring it should be ploughed as deep as the Surface will admit, turning the Sward into the Bottom of each Furrow; then it should be well harrowed, to break the Clods, and cleanse it from the Roots of noxious Weeds; and after this, it must be kept constantly ploughed and harrowed for at least one Year, to render the Surface light; and hereby it will be rendered fertile, by imbibing the nitrous Particles of the Air (especially if it be long exposed thereto before it is planted;) then in *March* the Ground should be well ploughed again, and after having made the Surface pretty even, the Rows should be marked out from South-east to North-west, at the Distance of ten Feet from each other; and these Rows should be crossed again at five or six Feet Distance, which will mark out the exact Places where each Plant should be placed, so that the Vines will be ten Feet Row from Row, and five or six Feet asunder in the Rows, nearer than which they ought never to be planted. And herein most People, who have planted Vineyards, have greatly erred, some having allowed no more than five Feet Row from Row, and the Plants but three Feet asunder in the Rows, and others, who think they have been full liberal in this Article, have only planted their Vines at six Feet Distance every Way, but neither of these have allowed a proper Distance to them, as I shall shew; for, in the first Place, where the Rows are placed too close, there will not be Room for the Sun and Air to pass in between them to dry up the Moisture, which, being detained amongst the Vines, must produce very ill Effects: And, secondly, where the Vines are placed in exact Squares, so near together as six Feet, there can be no Room for the Current of Air to pass between them, when their Branches are extended on each Side, and so consequently the Damps in Autumn will be entangled and detained amongst the Vines, to the great Prejudice of their Fruit; for since the Autumns in *England* are often attended with Rains, cold Dews, or Fogs, all proper Care should be taken to remove every Thing which may obstruct the drying up the Damps which arise from the Ground.

The skilful *Vignerons* Abroad are also sensible how much it contributes to the Goodness of their Vines to allow

allow a large Space between the Rows; and therefore where the Quality of the Wine is more regarded than the Quantity, there they never plant their Vines at less than ten Feet Row from Row, and some allow twelve. It was an Observation of *Bellonius*, almost two hundred Years since, that in those Islands of the *Archipelago*, where the Rows of Vines were placed at a great Distance, the Wine was much preferable to those which were close planted; and this he positively affirms to be the Case in most Countries where he had travelled. In deed we need not have Recourse to Antiquity for the Certainty of such Facts, when we are daily convinced of this Truth in all close Plantations of any Kind of Fruit, where it is constantly observed, that the Fruits in such Places are never so well coloured, so early ripe, nor near so well flavoured, as those produced on Trees, where the Air can freely circulate about them, and the Rays of the Sun have free Access to the Branches, whereby the Juices are better prepared before they enter the Fruit.

Having thus considered the Distance which is necessary to be allowed to these Plants, we come next to the planting; but in order to this, the proper Sorts of Grapes should be judiciously chosen; and in this Particular, we have egregiously erred in *England*. All the Vineyards at present planted here, are of the sweetest and best Sort of Grapes for eating, which is contrary to the general Practice of the *Vignerons* Abroad, who always observe, that such Grapes never make good Wine; and therefore, from Experience, make choice of those Sorts of Grapes, whose Juice, after fermenting, affords a noble rich Liquor; which Grapes are always observed to be austere, and not by any means palatable. This is also agreeable to the constant Practice of our Cyder Makers in *England*, who always observe, that the best eating Apples make but poor Cyder; whereas the more rough and austere Sorts, after being pressed and fermented, afford a strong vinous Liquor. And I believe it will be found true in all Fruits, that where the natural Heat of the Sun ripens and prepares their Juices, so as to render them palatable, whatever Degree of Heat these Juices have more, either by Fermentation, or from any other Cause, will render them weaker, and less spirituous. Of this we have many Instances in Fruits; for if we transplant any of our Summer or Autumn Fruits, which ripen perfectly in *England*, without the Assistance of Art, into a Climate a few Degrees warmer, these Fruits will be mealy and insipid; so likewise if we bake or stew any of these Fruits, they will be good for little, losing all their Spirit and Flavour by the additional Heat of the Fire; and such Fruits as are by no means eatable raw, are hereby rendered exquisite, which, if transplanted into a warmer Climate, have, by the additional Heat of the Sun, been also altered so as to exceed the most delicious of our Fruit in this Country.

From whence it is plain, that those Grapes which are agreeable to the Palate for eating, are not proper for Wine; in making of which, their Juices must undergo a strong Fermentation; therefore since we have in *England* been only propagating the most palatable Grapes for eating, and neglected the other Sorts, before we plant Vineyards, we should take care to be

provided with the proper Sorts from Abroad, which should be chosen according to the Sort of Wines intended to be imitated; though I believe the most probable Sort to succeed in *England*, is the *Auvernat*, or true *Burgundy* Grape, (which is at present very rare to be found in the *English* Vineyards; though it is a common Grape in the Gardens against Walls). This Sort of Grape is most preferred in *Burgundy*, *Champaign*, *Orleans*, and most of the other Wine Countries in *France*; and I am informed, that it succeeds very well in several Places to the North of *Paris*, where proper Care is taken of their Management; so that I should advise such Persons as would try the Success of Vineyards in *England*, to procure Cuttings of this Grape from those Countries; but herein some Person of Integrity and Judgment should be employed to get them from such Vineyards where no other Sorts of Grapes are cultivated; which is very rare to find, unless in some particular Vineyards of the Citizens, who are very exact to keep up the Reputation of their Wines; nothing being more common than for the *Vignerons* to plant three or four Sorts of Grapes in the same Vineyard, and at the Time of Vintage to mix them all together; which renders their Wines less delicate than in such Places where they have only this one true Sort of Grape. And here I would caution every one against mixing the Juice of several Grapes together, which will cause the Wine to ferment at different Times, and in different Manners.

The Cuttings being thus provided (for I would always prefer these to Layers, or rooted Plants, for the Reasons given at the Beginning of the Article *Vitis*) about the Beginning of *April* is the best Season for planting; when it will be proper to put the lower Ends of the Cuttings in Water about three Inches, setting them upright, for six or eight Hours before they are used; then at the Center of every cross Mark already made by a Line, to the Distance the Vines are designed, should be a Hole made with a Spade, or other Instrument, about a Foot deep, into each of which should be put one strong Cutting, placing it a little sloping; then the Hole should be filled up with Earth, pressing it gently with the Feet to the Cutting, and raising a little Hill to each about three Inches, so as just to cover the uppermost Eye or Bud, which will prevent the Wind and Sun from drying any Part of the Cuttings, and this upper Eye only will shoot; the under ones most of them will push out Roots, so that this Shoot will be very strong and vigorous.

After they are thus planted, they will require no other Care until they shoot, except to keep the Ground clear from Weeds, which should be constantly observed; but as the Distance between the Rows of Vines is very great, so the Ground between them may be sown or planted with any Kind of esculent Plants, which do not grow tall, provided there is proper Distance left from the Vines, and Care taken that the Vines are not injured by the Crops, or in the gathering, and carrying them off the Ground; and this Husbandry may be continued three or four Years, till the Vines come to bearing; after which Time there should be no Sort of Crop put between them in Summer; because the cleaner the Ground is kept between the Vines, from Weeds

Weeds or Plants, the more Heat will be reflected to the Grapes; but after the Grapes are gathered, there may be a Crop of Coleworts for Spring Use, planted between the Rows of Vines, and the cultivating of these will be of Use to the Vines, by stirring the Ground; but as to watering, or any other Trouble, there will be no Occasion for it, notwithstanding what some People have directed, for in *England* there is no Danger of their miscarrying by Drought. When the Cuttings begin to shoot, there should be a small Stick of about three Feet long stuck down by each, to which the Shoot should be fastened, to prevent their breaking or lying on the Ground, so that as the Shoots advance, the Fastening should be renewed, and all small lateral Shoots (if there are any such produced) should be constantly displaced, and the Ground between the Vines always kept clean. This is the whole Management which is required the first Summer.

But at *Michaelmas*, when the Vines have done shooting, they should be pruned; for if they are left unpruned till Spring, their Shoots being tender (especially toward their upper Parts) will be in Danger of suffering if the Winter should prove severe.

This Pruning is only to cut down the Shoots to two Eyes; and if, after this is done, the Earth be drawn up in a Hill about each Plant, it will still be a greater Defence against Frost.

At the Beginning of *March* the Ground between the Vines should be well dug, to loosen it, and render it clean; but you should be careful not to dig deep close to the Vines, lest thereby their Roots should be cut or bruised; and at the same Time the Earth should be again laid up in a Hill about each Plant; but there must be Care taken not to bury the two young Eyes of the former Year's Shoot, which were left to produce new Wood.

At the Beginning of *May*, when the Vines are shooting, there should be two Stakes fixed down to the Side of each Plant, which must be somewhat taller and stronger than those of the former Year; to these the two Shoots (if so many are produced) should be fastened, and all the small trailing or lateral Shoots should be constantly displaced, that the other Shoots may be stronger; and the Ground should also be kept very clear from Weeds as before.

The Autumn following these Vines should be pruned again in the following Manner; those of them which have produced two strong Shoots of equal Vigour, must be cut down to three Eyes each; but in such as have one strong Shoot and a weak one, the strong one must be shortened to three Eyes, and the weak one to two; and such Vines as have produced but one strong Shoot, should be shortened down to two Eyes also, in order to obtain more Wood against the succeeding Year.

In the Spring, about the Beginning of *March*, the Ground between the Vines should be again dug, as before, and two Stakes should be placed down by the Side of all such Vines as have two Shoots, at such Distance on each Side of the Plant as the Shoots will admit to be fastened thereto, and the Shoots should be drawn out on each Side to the Stakes, so as to make an Angle of about forty five Degrees with the Stem; but by no Means should they be bent down horizontally, as is by

some practised, for the Branches lying too near the Earth, are generally injured by the Damps which arise from thence, but especially when they have Fruit, which is never so well tasted, nor so early ripe upon those Branches, as when they are a little more elevated.

In *May*, when the Vines begin to shoot, they must be carefully looked over, and all the weak dangling Shoots should be rubbed off as they are produced, and those Shoots which are produced from strong Eyes, should be fastened to the Stakes to prevent their being broken off by the Wind.

This Management should be repeated at least every three Weeks, from the Beginning of *May* to the End of *July*; by which Means the Shoots which are trained up for the succeeding Year will not only be stronger, but also better ripened and prepared for bearing, because they will have the Advantage of Sun and Air, which is absolutely necessary to prepare their Juices; whereas if they are crowded by a Number of small dangling weak Branches, they will shade and exclude the Rays of the Sun from the other Shoots; and so by detaining the Moisture a longer Time amongst the Branches, occasion the Vessels of the young Wood to be of a larger Dimension; and hereby the crude Juice finds an easy Passage through them; so that the Shoots in Autumn seem to be mostly Pith, and are of a greenish immature Nature, and wherever this is observed, it is a sure Sign of a bad Quality in the Vines.

The Soil also should be constantly kept clean, because, if there are any Vegetables (either Weeds or Plants of other Kinds) growing between the Vines, it will detain the Dews longer, and by their Perspiration, occasion a greater Moisture, than would be, if the Ground were entirely clear; so that those who plant other Things between their Rows of Vines, are guilty of a great Error.

In Autumn the Vines should be pruned, which Season I approve of rather than the Spring (for Reasons before given;) and this being the third Year from planting, the Vines will now be strong enough to produce Fruit, therefore they must be pruned accordingly. Now suppose the two Shoots of the former Year, which were shortened to three Eyes, have each of them produced two strong Branches the Summer past, then the uppermost of these Shoots upon each Branch should be shortened down to three good Eyes (never including the lower Eye, which is situated just above the former Year's Wood, which seldom produces any thing, except a weak dangling Shoot;) and the lower Shoots should be shortened down to two good Eyes each; these being designed to produce vigorous Shoots for the succeeding Year; and the former are designed to bear Fruit; but where the Vines are weak, and have not produced more than two or three Shoots the last Season, there should be but one of them left with three Eyes for bearing; the other must be shortened down to two, or if weak to one good Eye, in order to obtain strong Shoots the following Summer, for there is nothing more injurious to Vines, than the leaving too much Wood upon them, especially while they are young, or the overbearing them; which will weaken them

them so much, as not to be recovered again to a good State in several Years; though they should be managed with all possible Skill.

In *March* the Ground between the Vines should be well dug as before, observing not to injure their Roots by digging too deep near them, but where there are small horizontal Roots produced on or near the Surface of the Ground, they should be pruned off close to the Places where they were produced; these being what the *Vignerons* call Day Roots, and are by no Means necessary to be left on: And after having dug the Ground, the Stakes should be placed down in the following Manner: On each Side of the Vine should be a Stake put in at about sixteen Inches from the Root, to which the two Branches, which were pruned to three Eyes, each for bearing, should be fastened, (observing, as was before directed, not to draw them down too horizontally;) then another taller Stake should be placed down near the Foot of the Vine, to which the two Shoots which were pruned down to two Eyes, should be fastened, provided they are long enough for that Purpose; but if not, when their Eyes begin to shoot, these must be trained upright to the Stakes, to prevent their trailing on the Ground, hanging over the Fruit Branches, or being broken by the Wind.

In *May* the Vines should be carefully looked over again, at which Time all weak lateral Branches should be rubbed off as they are produced; and those Shoots which shew Fruit, must be fastened with Bais to the Stakes to prevent their being broken, until they are extended to three Joints beyond the Fruit, when they should be stopped; but the Shoots which are designed for bearing the following Season, should be trained upright to the middle Stake, by which Method the Fruit Branches will not shade these middle Shoots, nor will the middle Shoots shade the Fruit, so that each will enjoy the Benefit of Sun and Air.

This Method should be repeated every Fortnight or three Weeks, from the Beginning of *May*, to the Middle of *July*, which will always keep the Shoots in their right Position, whereby the Leaves will not be inverted, which greatly retards the Growth of the Fruit; and by keeping the Vines constantly clear from horizontal Shoots, the Fruit will not be crowded with Leaves and shaded, but will have constantly the Advantage of the Sun and Air equally, which is of great Consequence; for where the Fruit is covered with these dangling Shoots in the Spring, and are afterwards exposed to the Air, either by divesting them of their Leaves, or else displacing their Branches entirely, as is often practised, the Fruit will become hard, and remain at a perfect Stand for three Weeks, and sometimes will never advance afterward, as I have several Times observed; therefore there cannot be too much Care taken to keep them constantly in a kindly State of Growth, as the *Vignerons* Abroad well know, though in *England* it is little regarded by the Generality of Gardeners, who, when their Grapes suffer by this Neglect, immediately complain of the Climate, or the Untowardness of the Season, which is too often a Cover for Neglects of this Nature. And here I cannot help taking Notice of the absurd Practice of those who pull off their Leaves from their Vines, which are placed near the Fruit in

order to let in the Rays of the Sun to ripen them; not considering how much they expose their Fruit to the cold Dews, which fall plentifully in Autumn, which, being imbibed by the Fruit, greatly retard them, besides, no Fruit will ripen so well when entirely exposed to the Sun, as when they are gently screened with Leaves; and by the pulling off these Leaves, which are absolutely necessary to prepare the Juices before they enter the Fruit, the gross Parts of which are perspired away by the Leaves, the Fruit must either be deprived of Nourishment, or else some of the gross Particles will enter with the more refined Parts of the Juice, and thereby render the Fruit worse than it would otherwise be, were the Leaves permitted to remain upon the Branches; for if the weak dangling Shoots are constantly displaced as they are produced, the Fruit will not be too much shaded by the Leaves that are upon the bearing Branches.

When the Fruit is ripe, if the Stalks of the Bunches are cut half through a Fortnight before they are gathered, it will cause the Juice to be much better, because there will not be near so great a Quantity of Nourishment enter the Fruit, whereby the watery Particles will have Time to evaporate, and the Juice will be better digested. This is practised by some of the most curious *Vignerons* in the South of *France*, where they make excellent Wine. But if, after the Fruit be cut, it is hung up in a dry Room upon Strings, so as not to touch each other, for a Month before they are pressed; it will also add greatly to the Strength of the Wine, because in that Time a great Quantity of the watery Parts of the Juices will evaporate. This is a constant Practice with some Persons who inhabit the *Tirolese*, on the Borders of *Italy*, where is made a most delicious rich Wine, as hath been attested by Dr. *Burnet* in his Travels; and I have heard the same from several Gentlemen, who have travelled that Road since.

But with all the Care that can possibly be taken, either in the Culture of the Vines, or in making the Wine, it will not be near so good while the Vineyard is young, as it will be after it has been planted ten or twelve Years; and it will be constantly mending, until it is fifty Years old, as is attested by several curious Persons Abroad as also by the most skilful Wine Coopers at Home, who can tell the Produce of a young Vineyard from that of an old one after it is brought to *England*, by the Colour of the Wine. This Difference is very easily accounted for, from the different Structure of the Vessels of the Plants; those of the young Vines being larger, and of a looser Texture, easily admit a larger Quantity of gross Nourishment to pass through them, whereas those of old Vines, which are more woody, are more closely constricted, and thereby the Juice is better strained in passing through them, which must consequently render it much better, though the Grapes from a young Vineyard will be larger, and afford a greater Quantity of Juice, so that People should not be discouraged if their Wines at first are not so good as they would wish; since afterward, when the Vineyard is a few Years older, the Wine may answer their Expectation. As to the fermenting and managing the Wine, that is treated of particularly under

under the Article *Wines*, to which the Reader is desired to turn.

The Vineyard being now arrived to a bearing State, should be treated after the following Manner: First, in the pruning there should never be too many Branches left upon a Root, nor those too long, for although by doing of this, there may be a greater Quantity of Fruit produced, yet the Juice of these will never be so good as when there is a moderate Quantity which will be better nourished and the Roots of the Plants not so much weakened; which is found to be of so bad Consequence to Vineyards, that when Gentlemen Abroad let out Vineyards to *Vignerons*, there is always a Clause inserted in their Leases to direct how many Shoots shall be left upon each Vine, and the Number of Eyes to which the Branches must be shortened; because were not the *Vignerons* thus tied down, they would overbear the Vines; so that in a few Years they would exhaust their Roots, and render them so weak as not to be recovered again in several Years; and their Wine would be so bad, as to bring a Disreputation on the Vineyard, to the great Loss of the Proprietor.

The Number of Branches which the *Italians* generally agree to leave upon a strong Vine, are four; two of the strongest have four Eyes, and the two weaker are shortened down to two Eyes each; which is very different from the common Practice in *England*, where it is usual to see six or eight Branches left upon each Root; and those perhaps left with six or eight Eyes to each; so that if these are fruitful, one Root must produce near four Times the Number of Bunches which the *Italians* do ever permit, and so consequently the Fruit will not be so well nourished, and the Roots will also be greatly weakened; as is the Case of all Sorts of Fruit Trees, when a greater Number of Fruit is left on, than the Trees can nourish.

The next Thing is, constantly to keep the Ground perfectly clean between the Vines, never permitting any Sorts of Plants or Weeds to grow there. The Ground should also be carefully dug every Spring and every third Year have some Manure, which should be of different Sorts, according to the Nature of the Ground, or which can be most conveniently procured.

If the Land is stiff, and inclinable to bind on the Surface, then Sea Sand, or Sea Coal Ashes, are either of them very good Manure for it; but if the Ground be loose and dry, than a little Lime mixed with Dung, is the best Manure for it. This must be spread thin upon the Surface of the Ground before it is dug, and in digging should be buried equally in every Part of the Vineyard. These are much preferable to that of all Dung for Vines; so that it will be worth the Expence to procure either of them; and as they require manuring but every third Year, where the Vineyard is large, it may be divided into three equal Parts, each of which may be manured in its Turn, whereby the Expence will be but little every Year; whereas when the Whole is manured together, it will add to the Expence; and in many Places there cannot be a sufficient Quantity procured to manure a large Vineyard in one Year.

This Digging and Manuring should always be performed about the Beginning of *March*, at which Time

all the superficial or Day Roots, as they are called, must be cut off, but the larger Roots must not be injured by the Spade, &c. therefore the Ground close to the Stem of the Vines must not be dug very deep. After this is done, the Stakes should be placed down, one on each Side the Vines, at about sixteen Laches from their Stems, to which the longest bearing Branches should be fastened, and one Stake close to the Stem, to which the two shorter Branches should be trained upright, to furnish Wood for the succeeding Year.

In the Summer they must be carefully looked over, as before, rubbing off all weak dangling Shoots, and training the good ones to the Stakes regularly, as they are produced, and those of them which have Fruit should be stopped in *June*, about three joints beyond the Bunches, but the upright Shoots, which are designed for bearing the following Year, must not be stopped till the Middle of *July*, when they may be left about five Feet long; for if they are stopped sooner in the Year, it will cause them to shoot out many dangling Branches from the Sides of the Eyes, which will not only occasion more Trouble to displace them, but also will be injurious to the Eyes or Buds.

N. B. All this Summer Dressing should be performed with the Thumb and Finger, and not with Knives, because the Wounds made by Instruments in Summer do not heal so soon as when stopped by gently nipping the leading Bud, which, if done before the Shoot is become woody, may be effected with great Ease, being very tender while young.

When a Vineyard is thus carefully dressed, it will afford as much Pleasure in viewing it as any Plantation of Trees and Shrubs whatever, the Rows being regular; and if the Stakes are exactly placed, and the upright Shoots stopped to an equal Height, there is nothing in Nature which will make a more beautiful Appearance; and during the Season that the Vines are in flower, they emit a most grateful Scent, especially in the Morning and Evening; and when the Grapes begin to ripen there will be a fresh Pleasure arising in viewing of them.

But as the Beauty of Vineyards arises from the regular Disposition of the Branches of the Vines, great Care should be taken, in their Management, to train them regularly, and to provide every Year for new Wood to bear the succeeding Year; because the Wood which has produced Fruit is commonly cut quite away after the Fruit is gathered, or at least is shortened down to two Eyes, to force out Shoots for the next Year; where there is not a sufficient Number of Branches upon the Vine of those trained upright, so that in Summer, when the Vines are in Perfection, there should be six upright Shoots trained for the next Years Woody, and three or four bearing Branches with Fruit on them; more than these ought never to be left upon one Vine, for the Reasons before given.

N. B. The *Auvernat*, or true *Burgundy Grape*, is valued in *France* before any other Sort, because the Fruit never grows very close upon the Bunches, therefore are more equally ripened; for which Reason it should also be preferred in *England*; though in general, those Sorts are most esteemed with us that have always close Bunches, which is certainly wrong; for it may be observed, that the Grapes on such Bunches are

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commonly ripe on one Side, and green on the other ; which is a bad Quality for such as are pressed to make Wine.

I shall now subjoin a few Sorts of Vines, which are preserved in some curious Gardens, more for Variety, than the Value of their Fruit : These are,

1. *VITIS foliis cordatis dentatis subtus villosis, cirrbis racemiferis.* Flor. Zeyl. 99. Vine, with Heart-shaped indented Leaves hairy on the under Side, and branching Tendrils. *Vitis sylvestris Indica, acinis rotundis.* Raii, Dend. 67. Wild Indian Vine, with round Berries.

2. *VITIS foliis cordatis subtrilobis dentatis subtus tomentosis.* Lin. Sp. Pl. 203. Vine, with Heart-shaped indented Leaves, almost three-lobed, and woolly on their under Side. *Vitis sylvestris Virginiana.* C. B. P. 299. Wild Virginia Grape.

3. *VITIS foliis cordatis dentato-ferratis utrinque nudis.* Lin. Sp. Pl. 203. Vine with Heart-shaped, sawed, indented Leaves, smooth on both Sides. *Vitis vulpina dicta Virginiana nigra.* Pluk. Alm. 392. The Virginia Fox Grape.

4. *VITIS foliis quinatis, foliolis multifidis.* Hort. Cliff. 74. Vine with Leaves having 5 Lobes, and cut into many Points. *Vitis laciniatis-foliis.* Corn. Canad. 182. Vine with jagged Leaves, commonly called the Parsley-leaved Grape.

5. *VITIS foliis supradecompositis, foliis lateralibus pinatis.* Lin. Sp. Plant. 203. Vine with more than decomposed Leaves and lateral winged Lobes. *Frutex scandens petroselinifolius, Virginiana, claviculis donatus.* Pluk. Mant. 85. Climbing Virginia Shrub with Parsley Leaves, sending out Tendrils. *Reynardsonia* Rand. Ind. Hort. Chelf. Falsly called the Pepper Tree.

The 1st Sort grows naturally in both Indies. The Stalks of this are woody, and send out many slender Branches, furnished with branching Tendrils, by which they fasten themselves to the neighbouring Trees, and are thereby supported. The Leaves are Heart-shaped, indented on their Edges, and hairy on their under Side. The Flowers are disposed in Bunches, like those of the other Species, and are succeeded by round Berries or Grapes, of an austere Taste.

The 2d Sort hath ligneous Stalks which send out many Branches, that fasten themselves by Tendrils to any neighbouring Support. The Leaves of this are large, and for the most part divided into 3 Lobes indented on their Edges. The under Side of the Leaves is covered with a white Down. The Fruit is disposed in Bunches like the other Grapes. The Berries are round and black ; the Juice has a rough Flavour.

The 3d Sort has Heart-shaped Leaves, indented on their Edges, and smooth on both Sides. The Plants climb on Trees by the Help of their Tendrils, like those of the other Sorts. The Fruit is disposed in Bunches. The Berries are black, and their Juice has a Flavour resembling the Scent of a Fox, from whence the Inhabitants have given it the Title of Fox Grape.

The 4th Sort is supposed to grow naturally in Canada ; but it has been long cultivated in the European Gardens for its Fruit ; but as it has little Flavour, and ripens late in Autumn, it has been almost banished the English Gardens, where at present there are only a few Plants

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preserved for Variety. The Stalks and Branches of this are like those of the common Grape, but the Leaves are cut into many slender Segments. The Grapes are round and white, and are disposed in loose Bunches.

The 5th Sort is by Dr. *Linnaeus* ranged under this Genus of *Vitis*, but the Characters of this Plant are not sufficiently known in Europe, to determine the proper Genus to which it belongs, for the Plant seldom produces Flowers here, and has never produced any Fruit in England, for which Reason I have ranged it under the same Genus, upon Dr. *Linnaeus*'s Authority.

The Stalk of this Plant is ligneous, and sends out many slender Branches furnished with Tendrils, which fasten themselves to any neighbouring Plants for Support, and are garnished with Leaves composed of many smaller winged Leaves, so that they are divided somewhat like those of common Parsley ; they are of a lucid green on their upper Side, but are much paler on their under. The Flowers spring from the Wings of the Stalks in loose Bunches ; they are very small, white, and are composed of 5 small Petals which expand, and soon fall off ; these are not succeeded by any Fruit in England, but the Berries which I have received from America, had generally 3 Seeds in each.

Mr. *Rand* gave it the Title of *Reynardsonia*, from Mr. *Reynardson* of Hillendon, near Uxbridge, who was a great Collector of foreign Plants, but the Characters of the Genus were not mentioned.

The 1st Sort being a Native of warm Countries will not live in England without artificial Heat ; it is easily propagated by Seeds, when they are brought from the Countries where the Plants grow naturally ; for they do not produce any here ; these must be sown in small Pots, which should be plunged into a hot Bed of Tanners Bark. When the Plants come up and are fit to remove, they should be each transplanted into a separate small Pot filled with light Earth, and plunged into a fresh hot Bed of Tanners Bark, shading them from the Sun till they have taken new Root ; then they must be treated as other tender exotick Plants from the same Countries, always continuing them in the Stove, otherwise they will not thrive. These Plants cast off their Leaves every Winter.

The 2d and 3d Sorts grow in great Plenty in the Woods of America, where I have been informed, are many other Sorts, which produce Fruit very little inferior to some of the fine Sorts cultivated in Europe ; notwithstanding which, it is generally thought impossible to make Wine in America ; but this I dare say must proceed from a Want of Skill rather than any bad Quality in the Soil or Climate ; so that instead of planting Vineyards on their loose rich Lands (as hath been generally practised by the Inhabitants of those Countries), if they would plant them upon rising Ground, where the Bottom was rocky or hard near the Surface, I dare say they would have very good Success ; for the great Fault complained of in those Countries is, that the Grapes generally burst before they are fully ripe ; which must certainly be occasioned by their having too much Nourishment ; therefore, when they are planted on a poorer Soil, this will be in part remedied. Another Cause of this may proceed from the Moisture of the Air (occasioned by the Perspiration of Trees &c. which

which being imbibed by the Fruits may break their Skins. This indeed cannot be prevented until the Country is better cleared of the Timber; but however, this should caution People not to plant Vines in such Places where there are great Quantities of Woods, because of this Effect, which it hath on the Grapes. But to return:

These two Vines are preserved in the Gardens of those who are curious in Botany; but I have not seen either of them produce Fruit in this Country. They may be propagated by Layers as the common Grapes, which will take Root in one Year, and may be taken off, and transplanted in the Spring where they are to remain, which should be against a warm Wall; because if they are exposed to much Cold in Winter, they are often destroyed, especially while they are young.

Their Pruning and Management is the same with any other Sorts of Grapes; but only they should have fewer Shoots, and those shortened down very low; otherwise they will make very weak Shoots the following Year, and never arrive to any considerable Strength; so will not be capable of producing any Fruit.

The 4th Sort is planted against Walls, and treated as the common Vines, and may be propagated by Cuttings or Layers in like Manner.

The 5th Sort is preserved in some Gardens for Variety, but as it rarely produces Flowers in England, it has not much Beauty; it is a Native in Virginia and Carolina. From both of these Countries I have received the Seeds. As this Sort does not produce Seed here, it is generally propagated by laying down the young Branches, which will put out Roots in one Year fit to remove, when they may be taken off, and transplanted where they are to remain. These require Support; and as their young Branches are tender and liable to be killed by Frost, if they are planted against a Wall or Pale, exposed to the South, they will succeed much better than when they are fully exposed to the open Air, and supported by Props. The young Shoots of these Plants should be shortened down to 2 or 3 Buds in the Spring, which will cause the Shoots of the following Summer to be much stronger, and when they are regularly trained against the Wall or Pale, they will produce Flowers in warm Seasons.

This Plant is very apt to push out Suckers from the Root, by which it is often propagated, but the Plants so raised are very subject to send out Suckers again, whereby they are robbed of their Nourishment, and do not thrive so well as those which come from Layers.

VITIS IDÆA. See Vaccinium.

VITIS SYLVESTRIS. See Clematis.

ULEX. Lin. Gen. Pl. 786. *Genista Spartium*. Tourn. Inst. R. H. 645. Tab. 412. Furze Gorse, or Whins.

The Characters are,

The Flower has a two leaved Empalement; it has 5 Petals, and is of the Butterfly Kind. The Standard is large, erect, oval, Heart-shaped, and indented at the Point. The Wings are shorter and obtuse. The Keel is composed of 2 obtuse Petals, whose Borders are joined at Bottom; it has 10 Stamina, 9 joined, and one separate, terminated by single Summits, and oblong cylindrical Germina supporting a rising Style, crowned by a small obtuse Stigma. The

Germina turn to an oblong turgid Pod with 1 Cell, opening with 2 Valves, inclosing a Row of Kidney-shaped Seeds.

The Species are,

1. ULEX foliis villosis acutis spinis sparsis. Lin. Sp. Pl. 741. Ulex with acute-pointed hairy Leaves, and sparsed Spines. *Genista spinosa major, longioribus aculeis*. C. B. P. 394. The common Furze, Whins, or Gorse.

2. ULEX foliis obtusis solitariis, spinis simplicibus terminalibus. Flor. Leyd. Prod. 372. African Furze, or Whins, with single blunt Leaves. *Genista spartium bacciferum, erica foliis Africanum*, Pluk. Alm. 166. African Berry-bearing Furze, with a Leaf like Heath.

This Genus of Plants hath been titled by the antient Botanists, *Genista spinosa* and *Genista spartium*; but these being compound Names have been rejected; and as there is another Genus of Plants under the Title of *Genista*, Dr. Linnæus has applied this Title of *Ulex*, which is a Name used by Pliny, in this Genus.

The common Furze, Gorze, or Whins, as it is called in the different Counties in England, is so well known as to need no Description.

There are 2 or 3 Varieties of this, which are frequently met with on the Commons and Heaths, in most Parts of England; but as they are not specifically different, they are not worthy to be enumerated here, especially as they are Plants which are seldom cultivated.

But these have by many Botanists been mentioned as specifically different, for which Reason I sowed their Seeds in the Garden, and found all the Varieties arise from the same Seeds.

These Plants propagate themselves very plentifully by Seeds; so that when they are established in a Spot of Ground, they soon spread over the Place; for as the Seeds ripen, the Pods open with the Warmth of the Sun, and the Seeds are cast out with an Elasticity, to a great Distance all round, and these soon vegetate; whereby the Ground is filled with young Plants, which are not easily destroyed when they are well rooted in the Ground.

Some Years ago the Seeds of this Plant were sown to form Hedges about Fields; where, if the Soil was light, the Plants soon become strong enough for a Fence against Cattle; but as these Hedges in a few Years became naked at the Bottom, and some of the Plants frequently failed, there became Gaps in the Hedges; therefore the raising them has been of late Years, little practised. But there are some Persons who have sown the Seeds of this Plant on very poor hungry Gravel or sandy Land, which has produced more Profit than they could make of the Ground by any other Crop; especially in such Places where Fuel of all Sorts is dear; for this Furze is frequently used for heating Ovens, burning Lime, and Bricks, and also for drying Malt. And in some Places where there has been a Scarcity of Fuel, I have known poor Land, which would not have let for 5 Shillings per Acre, which has been sown with Furze, produce one Pound per Acre per Ann. so that there has been a considerable Improvement made by this Plant. But this is not worth practising in such Countries where Fuel of any Kind is cheap, or upon such Land as will produce good Grass or Corn; therefore it is only mentioned here to shew, that poor Lands

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may be so managed, as to bring an annual Profit to their Proprietors.

The 2d Sort is a Native of the Country near the Cape of Good Hope, where it usually grows to the Height of 5 or 6 Feet, but in Europe, where it is preserved as a Curiosity in some Gardens, it seldom rises so high. The Stalk is ligneous and hard, covered with a greenish Bark when young, but it afterwards becomes grayish. The Branches are slender and ligneous, the Leaves are single, obtuse, and the Shoots terminate with Spines. This Plant has been several Years in the English Gardens, but has not produced any Flowers.

This Plant is too tender to live in the open Air, through the Winter, in England; therefore it is preserved in Green-houses, with the hardier Sorts of exotick Plants, which do not require any artificial Heat to preserve them.

It is very difficult to propagate either by Layers, or Cuttings, for the Layers are generally 2 or 3 Years before they have sufficient Root to transplant, and the Cuttings do very rarely take Root, and as the Plant does not produce Seeds in Europe, it is very rare in the European Gardens. It is a plant of no great Beauty; but, as it is an Ever-green, it is admitted into the Gardens of those who are curious in Botany, for Variety.

ULMARIA. See Spiraea.

ULMUS, Tourn. Inst. R. H. 601. Tab. 372. Lin. Gen. PL. 281. The Elm Tree; in French, Orme.

The Characters are,

The Flower has a rough permanent Empalement of 1 Leaf, cut at the Rim into 5 Points, and coloured within; it has no Petals, but has 5 Awl-shaped Stamina, twice the Length of the Empalement, terminated by short erect Summits having a Furrow, and an orbicular erect German supporting 2 Styles which are reflexed, and crowned by hairy Stigmas. The German afterwards turns to a roundish, compressed, bordered Capsule, including 1 roundish compressed Seed.

The Species are,

1. *ULMUS foliis oblongis acuminatis, duplicato-serratis, basi inaequalibus.* Elm with oblong acute-pointed Leaves, doubly sawed on their Edges, and unequal at their Base. *Ulmus vulgarissimus, folio lato, scabro.* Ger. Emac. 1480. The common rough, or broad-leaved Witch Elm.

2. *ULMUS foliis oblongo-ovatis, inaequaliter serratis, calycibus foliaceis.* Elm with oblong oval Leaves unequally sawed, and leafy Empalements to the Flowers. *Ulmus folio latissimo, scabro.* Ger. Emac. 1481. The Witch Hazel, or rough and very broad-leaved Elm; by some unskilful Persons called the British Elm.

3. *ULMUS foliis ovatis acuminatis duplicato-serratis, basi inaequalibus.* Elm with oval acute-pointed Leaves doubly sawed, and unequal at their Base. *Ulmus minor, folio angusto, scabro.* Ger. Emac. 1480. The small-leaved or English Elm.

4. *ULMUS foliis ovatis glabris, acutè serratis.* Elm with oval smooth Leaves sharply sawed on their Edges. *Ulmus folio glabro.* Ger. Emac. 1481. The smooth-leaved Witch Elm.

5. *ULMUS foliis ovatis acuminatis angustis, inaequaliter serratis, cortice fungoso.* Elm with oval, acute-pointed, rough Leaves, unequally sawed, and a fungous Bark. *Ulmus major Hollandica, angustis & magis acuminatis sa-*

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marris, folio latissimo, scabro. Pluk. Alm. The Dutch Elm.

6. *ULMUS foliis oblongo-ovatis glabris acuminatis duplicato-serratis.* Elm with oblong, smooth, acute-pointed Leaves doubly sawed, *Ulmus minor, folio angusto, glabro.* The smooth narrow leaved Elm; by some called the upright Elm.

The first Sort is very common in the North-west Counties of England, where it is generally believed to grow naturally in the Woods; this grows to a very large Size. The Bark of the young Branches is smooth and very tough, but that of the old Trees cracks and is rough. The Branches spread, and do not grow so erect as those of the third Sort. The Leaves are rough, and are doubly sawed on their Edges. Their Base is unequal, about 3 Inches long and 2 broad, of a dark green Colour, and stand on short Foot Stalks. The Flowers come out in March, upon the slender Twigs, standing in Clusters; they are of a deep red Colour; these are succeeded by oval bordered Capsules, containing 1 roundish compressed Seed, which ripens in May. The Wood of this Tree is very good for all the Purposes of any Kind of Elm, and the Trees grow to a very large Size, but the Leaves do not come out till late in the Spring; so there are few Persons who plant these Trees near their Habitations.

The 2d Sort grows naturally in some of the Northern Counties of England, where it is frequently called Witch Hazel; from the Resemblance of the young Shoots and Leaves to those of Hazel. This grows to a Tree of great Magnitude. The Bark of the young Shoots is very smooth and tough; it is of a yellowish brown Colour, with Spots of white. The Leaves are oval, 6 Inches long, and almost 4 broad, and are unequally sawed on their Edges. The Flowers grow in Clusters toward the End of the Twigs; they have long leafy Empalements of a green Colour, and appear in the Spring, before their Leaves, and the Seeds ripen the latter End of May. The Wood of this Tree is not so good for Use, as that of the first Sort. Formerly, when long Bows were in Use, many of them were made of the Boughs of this Tree.

The 3d Sort is commonly known in the Nursery Gardens by the Title of English Elm, which is far from being a right Appellation, for it is not a native of England, and is only found growing near London, or in Plantations where the young Trees were procured from the Neighbourhood of London. Where this Tree grows naturally is not easy to determine; some Persons have supposed it was brought from Germany. As this Tree is well known, it requires no Description. The Flowers of this are of a purplish red Colour, and generally appear the Beginning of March, but I could never observe any Seeds upon this Sort.

The 4th Sort is very common in several Parts of Hertfordshire, Essex, and other North-east Counties of England; this grows to a large Tree, and is much esteemed. The Branches spread out like those of the first Sort. The Leaves are oval, and sharply sawed on their Edges; they are smoother than most of the other Sorts, and do not appear till the Middle or latter End of May; so the Trees are seldom planted near Habitations.

The 5th Sort is well known by the Title of Dutch Elm;

Elm; this was brought from *Holland* the Beginning of King *William's* Reign, and was for some Time a fashionable Tree, and has been recommended for its quick Growth; it was some Years ago in great Request for forming Hedges in Gardens, for which Purpose it was one of the most improper Trees that could be chosen; for they made very strong irregular Shoots, which are distant from each other. The Leaves were very large and rough, and the Branches covered with a fungous rough Bark, which was disagreeable, so that when the Hedges were sheared, they appeared naked and disagreeable the whole Summer after. The Wood of this Tree is good for nothing, so it is almost banished this Country.

The 6th Sort is found growing in Hedge Rows in several Parts of *England*. The Branches of this Sort have a smooth grayish Bark, and grow erect. The Leaves are narrower, and more pointed than those of the *English Elm* and are smoother; they are later in coming out in the Spring than those, but continue longer in Autumn; this has been by some called the *Irish Elm*.

There are some other Varieties of this Tree which are preserved in the Nursery Gardens, but their Difference is not remarkable enough to deserve Notice; therefore they are omitted, as are also those with variegated Leaves; of which there are several Varieties propagated in the Nurseries about *London*; these are by some Persons esteemed.

All the Sorts of Elm may be either propagated by Layers or Suckers taken from the Roots of the old Trees, the latter of which is generally practised by the Nursery Gardeners; but as these are often cut up with indifferent Roots, they often miscarry, and render the Success doubtful; whereas those which are propagated by Layers are in no Hazard, and always make better Roots, and come on faster than the other, and do not send out Suckers from their Roots in such Plenty, for which Reason this Method should be more universally practised. And since a small Compass of Ground filled with Stools of these Plants will be sufficient to furnish a Nursery of a considerable Extent, annually with Layers to be transplanted, it is richly worth every Person's while, who would cultivate these Trees, to allot a Spot of Ground for this Purpose.

The best Soil for such a Nursery is a fresh Hazel Loam, neither too light and dry, nor over moist and heavy; this Ground should be well trenched, and if a little rotten Dung is buried therein, it will be of Service; in doing this great Care should be taken to pick out all Roots of Pernicious Weeds, which, if left in the Ground, would be very injurious to the Layers, and cannot afterwards be so easily rooted out; then having laid the Ground level, the Plants must be planted at about 8 Feet asunder each Way. The best Season for this Work is in Autumn, as soon as the Leaves begin to decay, that they may take Root before the dry Weather in the Spring comes on, whereby a great Expence of watering them will be saved; for if they are well settled in the Ground before the dry Weather, they will require little more than to mulch their Roots, to keep the Earth from drying.

These Plants should be permitted to grow rude 2

Years, during which Time the Ground between should be carefully cleaned and dug every Spring, by which Time they will be well rooted, and have made pretty strong Shoots, so that they may be laid in the Ground. The Manner of performing this being already described in the Article *Layers*, I shall forbear repeating it in this Place.

When these Layers are well rooted, which will be in one Year, they should be taken off, and transplanted out into a Nursery, which should be on a good Soil, and well prepared (as before for the Stools). The Plants should be planted in Rows 4 Feet asunder, and 2 Feet Distance Plant from Plant in the Rows. This should be done in Autumn, as soon as the Leaves begin to decay, and if there is some Mulch laid on the Surface of the Ground about their Roots, it will preserve them from being hurt by Frost in Winter, and from drying Winds in Spring, and thereby secure them from all Hazard.

The following Summer the Ground between them should be constantly kept clean from Weeds, and in Autumn they should be pruned up, cutting off all strong lateral Branches, which, if left on, would impede their upright Growth, but there must be some of the smaller Shoots left on to detain the Sap, in order to augment the Stems of the Trees; for where they are pruned up too naked, they are apt to grow up too slender to support themselves, so that their Heads will recline to the Ground, and cause their Stems to grow crooked.

In this Nursery they may remain 4 or 5 Years, observing constantly to dig the Ground between them every Spring, and to trim them as before directed, which will promote their Growth, and render them strong enough to transplant out where they are to remain, in the Time before mentioned.

These Trees are very proper to plant in Hedge Rows, on the Borders of Fields, where they will thrive much better than when planted in a Wood, or close Plantation, and their Shade will not be very injurious to whatever grows under them; but when these Trees are transplanted out upon Banks after this Manner, the Banks should be well wrought and cleared from all other Roots, otherwise the Plants, being taken from a better Soil, will not make much Progress in these Places. About *Michaelmas* will be a good Time for this Work for the Reasons before assigned, but when they are planted, there should be some Stakes fixed in by them, to which they should be fastened to prevent their being displaced by the Winds, and Part of their Heads should be taken off, before they are planted, which will also be of Use in preventing their being easily overturned by Winds, but by no Means should their leading Shoot be stopped, nor the Branches too closely cut off; for if there are not some Shoots left on to draw and attract the Sap, they will be in Danger of miscarrying.

These Trees are also proper to plant at a Distance from a Garden or Building to break the Violence of Winds, for which Purpose there is not any Tree more useful, for they may be trained up in Form of a Hedge, keeping them cut every Year, which will cause them to grow very close and handsome, to the Height of 40 or 50 Feet, and be a great Protection against the

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Fury of Winds, but they should not be planted too near a garden, where Fruit Trees, or other Plants, are placed, because the Roots of the Elms run superficially near the Top of the Ground to a great Distance, and will intermix with the Roots of the other Trees, and deprive them of Nourishment; nor should they be planted near Gravel or Grass Walks, which are designed to be well kept, because the Roots will run into them, and send forth Suckers in great Plenty, which will deface the Walks, and render them unsightly.

But for large Gardens, where Shade is required, there is scarce any Tree so proper for that Purpose, being easy to remove when grown to a considerable Size, so that a Person who is willing to have his Plantations for shade in a short Time, may procure Trees of near one Foot Circumference in their Trunk, which will be in little Danger of not succeeding, provided they are removed with Care. And these will take Root, and grow very well, though not so well as young Plants, which is what few other Sorts of Trees will do, but then they should be such Trees as have been thus regularly trained up in a Nursery, and have good Roots, and not such as are taken out of Hedge Rows (as is by some practised), which seldom rise with any tolerable Roots, and consequently often miscarry, and this has been the Occasion of so many Plantations of these Trees failing, for although some of them may live a few Years, yet few of them are of long Duration, and they rarely increase much in their Stems, but frequently grow hollow, their Heart decaying first, so that they are supported only by their Bark or Shell, for a few Years, and the first severe Winter, or very dry Summer, they are generally destroyed.

But although I have said, that Elms which are trained up in a Nursery may be removed with Safety, at a larger Size than most other trees, yet I would not have it understood, that by this I would recommend planting them when large, for if People would have a little Patience when they plant, and never plant any of these Trees which are more than 4 or 5 Inches in Girth of their Stems, they will in a few Years become better Trees than any of those which are transplanted of a much larger Growth, and they will always grow to a much larger Size; besides, they are much more easily removed, and do not require to be so strongly supported, nor is there much Danger of the young Trees miscarrying, therefore it is much more eligible to make choice of young thriving Trees (but not out of a better Soil than that where they are to be planted), and never to plant any large Trees, unless where a small Number may be wanted for an immediate Shade, and in such Cases, it is always proper to plant some young Trees among the large ones, to succeed them when they fail.

In planting these Trees great Care should be taken not to bury their Roots too deep, which is very injurious to them, especially if they are planted on a moist Loam or Clay, in which Case, if the Clay is near the Surface, it will be the best Way to raise the Ground in a Hill, where each Tree is to be planted, which will advance their Roots above the Surface of the Ground, so that they will not be in Danger of rotting in Winter with Moisture.

When these Trees are propagated by Suckers taken

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from the Foot of old Trees, they are commonly laid into the Ground in Rows pretty close together in Beds, where, in dry Weather, they may be frequently watered to encourage their putting out Roots. In these Beds they are left commonly 2 Years, by which Time those that live will be rooted (though a great many of them generally die); then they are transplanted into the Nursery, and managed as hath been directed for the Layers.

There are some who raise the Witch Elm from Seeds, which it generally produces in great Plenty, and are ripe in May; these should be sown on a Bed of fresh loamy Earth, and gently covered. In dry Weather they should be watered, and if the Bed is shaded from the violent Heat of the Sun, it will be of great Service to the Seeds (for I always observe the Plants to come up better in the Shade, than when exposed to the Sun). When the Plants come up, they should be carefully cleared from Weeds, and after they have stood 2 Years in the Seed Bed, they will be fit to plant out into the Nursery, where they must be managed as the former.

When we view many of the late Plantations which have been made in Parks and Gardens, within 40 Years past, at a very great Expence, and observe the little Progress they have made, it is enough to deter others from attempting to make Plantations of this Tree; for, as great Part of the Trees have been taken out of Hedge Rows, and from Places where they have sprung up from the Roots of old Trees, they had but few Roots, and those not furnished with Fibres, so such of the Trees as survived their Removal have made scarce any Progress, and I have seen many Plantations, which had been growing 10, 12, or more Years, almost totally destroyed in a severe Winter, and sometimes by a very dry Summer; for, as their Roots had not extended far in the Ground, the Trees were weak, and though they kept alive, yet were not able to resist a severe Frost, or a great Drought, but the Planters were in a Hurry, and wanted immediate Shade and Prospect, so in order to obtain these, pursued a Method in which they could never hope to have either in any Degree of Perfection; whereas, if they had planted Trees no bigger in their Stems than a Man's Thumb, in 10 or 12 Years Time, they would have had both, with the Pleasure of seeing an annual Progress of their Trees, at a Time when their large-planted Trees are decaying.

I have seen some expensive Plantations of this, which have seemed to succeed for 2 or 3 Years, by making strong Shoots most Part of the Length of their Stems, which has greatly deceived their Planters, who did not doubt but their Trees were out of Danger, but in a few Years after they found most of their Tops decay, and their Hearts were rotting apace, so became hollow, and although they continued to put out lateral Shoots, yet their Stems never increased in Size.

In some Plantations made in the same Place a few Years, with Trees not a tenth Part so large, they are now more than double the Size of the large ones, and in a most thriving State, whereas the others do little more than just keep alive; therefore I advise every Person, who wishes to have their Trees thrive and become large, to plant them young, which may be performed for a very small Sum, when compared with that of the other.

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Another Piece of Advice may be also necessary here, which is, not to top or cut the Trees, as is too much practised about London, which not only impedes their Growth, but occasions their decaying soon.

UMBELLA, an Umbel, is the Extremity of a Stalk or Branch, divided into several Pedicles or Rays, beginning from the same Point, and opened in such a Manner as to form an inverted Cone. When the Pedicles, into which the Stalk is divided, are subdivided into others of the same Form, upon which the Flowers or Fruits are disposed, the first Order is called Rays, the second Pedicles. That Umbel which consists of Pedicles only is called a simple Umbel; that which is composed both of Rays and Pedicles is called a compound Umbel.

UMBELLIFEROUS PLANTS are those whose Flowers are produced in an umbel, on the Top of the Stalks, where they, in some Manner, represent an umbrell. Of this Kind are Parsneps, Carrots, Fennel, Parsley, &c.

VOLKAMERIA. Lin. Gen. Plant. 706.

The Characters are,

The Flower has an Empalement of one Leaf, which is indented at the Brim in 5 Parts; it has one ringent Petal, having a cylindrical Tube twice the Length of the Empalement, but is spread open at the Brim, where it is cut into 5 equal Segments, and 4 long slender Stamina terminated by single Summits, and a four-cornered Germen supporting a slender Style crowned by a bifid Stigma. The Germen becomes a roundish Capsule with 2 Cells including one Seed in each.

We have but one Species of this Genus, viz.

VOLKAMERIA. We have no English Title for this Plant. It is the *Volkameria ramis inermibus*. Flor. Zeyl. 231. *Volkameria* with unarmed Branches. This Plant is figured by Dr. Plukenet, Tab. 211. f. 4. by the following Title; *Periclymeni similis myrtifolia arbor Madagascariensis*. A Plant resembling Honeyuckle from Madagasc.

This Plant grows naturally in India; it sends out many weak shrubby Stalks 12 or 14 Feet high, covered with a white Bark, and garnished with oval Spear-shaped Leaves, 3 Inches long, and one and a Half broad, of a lucid green Colour and smooth; they are placed by Pairs on short Foot Stalks. The Flowers are produced from the Wings of the Stalks in umbellated Bunches like the common Sort of Jasmine, to which they have a great Resemblance, but the Segments of the Petal are not so acute-pointed; they are white, and have an agreeable Odour; these have each 4 Stamina longer than the Petal, terminated by single Summits. The Germen turns to a roundish Capsule with 2 Cells, each including one Seed.

This Plant is easily propagated by Cuttings, which is the Method usually practised here, because the Plants do not produce Seeds in England; these Cuttings should be planted in pots during any of the Summer Months, and plunged into a hot Bed of Tan, where they should be shaded from the Sun till they have taken Root, then they should be gradually hardened to bear the open Air, and afterward transplanted each into a small Pot filled with light loamy Earth, and placed in the Shade, till they have taken new Root, then they may be removed to a warm sheltered Situation. to remain till the

Middle or latter End of September, at which Time they should be removed into the Stove, and during the Winter Season kept in a moderate Temperature of Warmth, but in Summer, they should be exposed to the open Air in a sheltered Situation; with this Management they will thrive, but do not annually produce Flowers in England. The Cuttings were sent me by Dr. Bernard de Jussieu, Demonstrator of the Plants in the Royal Garden at Paris, which produced Flowers 2 Years after in the Chelsea Garden.

URENA. Hort. Elth. 319. Lin. Gen. Pl. 754. Indian Mallow.

The Characters are,

It hath a malvaceous Flower with a double Empalement, the outer being of 1 Leaf slightly cut at the Brim into 5 Parts, but the inner is five-leaved, permanent, and cut to the Bottom. The Flower is composed of 5 Leaves which are oblong, and blunt at their Extremity, but narrow at their Base, where they coalesce. In the Center there are many Stamina which are joined, and form a Column at their Base, but spread open above. It has a roundish five-cornered Germen with a single Style, and 10 hairy reflexed Stigmas. The Germen changes to a pentagonal Fruit which is burry, and divides into 5 Cells, each having 1 angular Seed.

The Species are,

1. URENA foliis angulatis. Lin. Hort. Cliff. 248. Indian Mallow with angular Leaves. *Urena Sinica Xanthii facie*. Hort. Elth. 340. *Urena* of China having the Appearance of lesser Burdock.

2. URENA foliis inferioribus angulatis, superioribus trilobis quinquelobisque acutè serratis. *Urena* with angular lower Leaves, the upper ones divided into 3 or 5 Lobes which are sharply sawed. *Alcea Indica frutescens foliis ad marginem exasperatis, bryoniae albae diversis*, & *Sinu Bengalensi*. Pluk. Phyt. Tab. 5. fig. 3. Indian shrubby Vervain Mallow from Bengal with Leaves having Prickles on their Edges, and divided like those of the white Bryony.

3. URENA foliis sinuato-multifidis villosis. Flor. Zeyl. 257. *Urena* with sinuated hairy Leaves having many Points. *Alcea Indica frutescens, foliis in laciniis variè dissectis*. Pluk. Phyt. Tab. 74. fig. 1. Shrubby Indian Vervain Mallow with Leaves variously cut.

The Title of *Urena* was applied to this Genus by Dr. Dillenius, in the *Hortus Elthamensis*, as the Characters of the Plants differ from all the Genera of the malvaceous Tribe, and this being a Name applied to it in the *Hortus Malabaricus*.

The 1st Sort grows naturally in China; this rises with an upright Stalk upward of 2 Feet high, which becomes ligneous toward the Autumn. It sends out a few Side Branches which are taper, stiff, and have a dark green Bark; they are garnished with roundish angular Leaves, about 2 Inches long, and 2 Inches and a Quarter broad, standing on pretty long Foot Stalks; they are of a dark green on their upper Side, and are pale on their lower. The Flowers come out single from the Wings of the Stalk, sitting close to it; they are shaped like those of the Mallow, but are small, and of a deep Blush Colour; these are succeeded by roundish Capsules, armed with prickly Hairs, divided into 5 Cells, each containing one Kidney-shaped Seed. It flowers from July till Winter, and the Seeds ripen in Succession.

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The 2d Sort grows naturally on the Coast of Malabar, from whence I received the Seeds; this rises with a ligneous Stalk 3 Feet high, dividing into 4 or 5 Branches, which have a grayish Bark; they are garnished with Leaves of different Forms; those on the lower Part are angular, an Inch and a Half long, and about the same Breadth; those above are cut some into 3, and others have 5 angular obtuse Lobes; they are of a dark green on their upper Side, but pale on their under; they are sharply sawed on their Edges, and stand on long Foot Stalks. The Flowers come out singly from the Wings of the Stalk; they are shaped like those of the other, but are larger. The Petals are narrower at their Base, and they have deep red Bottoms. These appear in August and September, but unless the Autumn proves warm, the Seeds will not ripen in this Country.

The Seeds of the third Sort came from Malabar; the Stalks of this are hairy, and divide into many Branches: It rises about 2 Feet high, and is garnished with oblong Leaves divided into 3 obtuse Lobes to the Mid-rib. The Lobes are indented in several Parts; they are of a light green on both Sides, and hairy. The Flowers sit close to the Stalks singly at the Wings; they are shaped like those of the Former, but are of a pale Blush Colour, with a deep red Bottom. These appear in August and September, but unless the Season proves warm, the Seeds do not ripen in England.

These Plants are propagated by Seeds, which should be sown on a hot Bed early in the Spring; and when the Plants are fit to remove, they should be transplanted into Pots, and plunged into a fresh hot Bed to bring them forward, and afterward they must be treated as hath been directed for the tender Sorts of Hibiscus, to which the Reader is desired to turn. If the Plants are brought forward in the Spring, and afterward placed in the Stove, or under a deep Frame, they will ripen Seeds the first Season, but if they should not, they may be preserved through the Winter in the Stove, and will ripen their Seeds the following Season, after which the Plants seldom continue.

URTICA. Tournef. Inst. R. H. 534. Tab. 308. Lin. Gen. Plant. 935. The Nettle; in French Ortie.

The Characters are,

It has male and female Flowers at remote Distances, sometimes on the same, and at others on separate Plants. The male Flowers have an Empalement composed of 4 roundish concave Leaves; these have no Empalements; they have a Pitcher-shaped Nectarium in the Center of the Flower, and 4 Awl-shaped spreading Stamina terminated by Summits with 2 Cells. The female Flowers have an oval permanent Empalement with 2 Valves; they have neither Petals nor Stamina, but an oval Germen, without any Style, crowned by a hairy Stigma. The Germen afterward turns to an oval compressed Seed which ripens in the Empalement.

The Species are,

1. URTICA foliis oppositis cordatis, racemis geminis. Lin. Sp. Pl. 984. Nettle with Heart-shaped Leaves placed opposite, and double Spikes of Flowers. *Urtica urens maxima*. C. B. P. 232. The greatest stinging Nettle.

2. URTICA foliis oppositis ovalibus. Lin. Sp. Pl. 984. Nettle with oval Leaves placed opposite. *Urtica urens minor*. C. B. P. 232. Smaller stinging Nettle.

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3. URTICA foliis oppositis cordatis, amentis fructiferis globosis. Nettle with Heart-shaped Leaves placed opposite, and Seed-bearing globular Katkins. *Urtica urens pilulas ferens* f. *Dioscoridis*, semine lini. C. B. P. 232. Stinging Nettle, bearing Pills and Seeds like Flax, commonly called Roman Nettle.

4. URTICA foliis oppositis ovato-lanceolatis, subintegerrimis, amentis fructiferis globosis. Nettle with oval Spear-shaped Leaves almost entire, and placed opposite, and globular Seed-bearing Katkins. *Urtica altera, pilulifera, parietariae foliis*. Aët. Par. 131. Another Pill-bearing Nettle with a Leaf like Pellitory, commonly called Spanish Marjoram.

5. URTICA foliis oppositis tripartitis incisiss. Hort. Ups. 282. Nettle with Leaves placed opposite, and cut into 3 Parts. *Urtica foliis profundè laciniatis, semine lini*. Ammon. Ruth. 249. Nettle with Leaves which are deeply cut, and Seeds like Flax.

6. URTICA foliis oppositis oblongis, amentis cylindricis solitariis indivisis. Lin. Sp. Pl. 984. Nettle with oblong Leaves placed opposite, and single, cylindrical, undivided Katkins. *Urtica foliis oblongis serratis nervosis petiolatis*. Flor. Virg. 187. Nettle with oblong, sawed, veined Leaves growing on Foot Stalks.

7. URTICA foliis oppositis ovato-lanceolatis acuminatis crenatis, amentis cylindricis indivisis. Nettle with oval, Spear-shaped, acute-pointed, crenated Leaves, placed opposite, and cylindrical undivided Katkins. *Urtica minor iners Mariana, seminibus ex alis foliorum racemosis non ramosis*. Pluk. Mant. 190. Smaller Nettle of Maryland with Seeds growing in long Bunches from the Wings of the Leaves, but not branched.

8. URTICA foliis alternis cordato-ovatis, amentis racemosis distichis erectis. Hort. Cliff. 441. Nettle with oval Heart-shaped Leaves, placed alternate, and erect, branching, double Katkins. *Urtica maxima, racemosa Canadensis*. H. R. Par. Greatest branching Nettle of Canada.

9. URTICA foliis alternis orbiculato utrinque acutis subtus tomentosis. Hort. Cliff. 441. Nettle with orbicular Leaves, pointed at both Ends, placed opposite, and woolly on their under Side. *Urtica racemifera maxima sinarum, foliis subtus argenteâ lanugine villosis*. Pluk. Amaltb. 212. Greatest branching China Nettle, whose Leaves are covered with a silvery, hairy Down on their under Side.

The 1st of these Sorts is a very common Weed on the Sides of the Banks, Ditches, and other uncultivated Places, where its Roots will spread, and over run the Grounds; so that it should always be carefully extirpated from Gardens; it is sometimes used in Medicine, but may be easily procured from the Fields at almost any Season.

The 2d Sort is also a very common Weed in Gardens, and cultivated in Fields; but it being an annual Plant, is not so difficult to eradicate as the former.

These Plants are so well known as to need no Description.

The 3d Sort grows naturally in Romney Marsh, and near Yarmouth; this is an annual Plant which rises near 3 Feet high. The Stalk is herbaceous, thick, of a purplish Colour, and armed in every Part with stinging Hairs. The Branches come out opposite. The Leaves

Leaves are Heart-shaped, the lower ones are 3 Inches long, and 2 broad toward their Base, and ending in acute Points, they are deeply sawed on their Edges, and stand opposite on long Foot Stalks; these are also armed with stinging Hairs on both Sides. The male and female Flowers come out from the Wings of the Leaves at the same Joint, on each Side the Stalk. The male standing above the female, upon long slender Foot Stalks or Katkins, placed very loosely. The female Flowers have shorter Foot Stalks, and are in globular Heads; these are succeeded by smooth shining Seeds like those of the Flax. It flowers in *July* and *August*, and the Seeds ripen in Autumn.

There is a Variety of this growing naturally in the *Balearick* Islands, which was discovered by Mr. *Salvatore*, an Apothecary in *Barcelona*, who sent the Seeds to *England*, which were sown in the *Chelsea* Garden, but the Plants, when cultivated, approached so near to the last mentioned Sort, in every Part except the Colour of the Stalk, as to make it doubtful of its being a distinct Species.

The 4th Sort grows naturally in *Spain* and *Italy*; this is also an annual Plant, whose Stalks are much slender than those of the former, and seldom branch. The Leaves are placed by Pairs, on very slender Foot Stalks, they are oval, Spear-shaped, and for the most Part entire, and have male and female Flowers springing from the Wings of the Leaves, which are shaped like the former, the whole Plant being armed with stinging Hairs. This flowers and perfects its Seeds at the same Time as the other.

These Plants may be easily propagated, by sowing their Seeds in *March*, on a Bed of light rich Earth, and when the Plants are come up, they should be transplanted out into Beds, or the Borders of the Pleasure Garden, interspersing them among other Plants, that they may not be easily discovered by Persons whom there is a Design to deceive, by gathering a Sprig for them to smell to. After the Plants have taken Root, they will require no farther Care, but only to keep them clear from Weeds. In *July* they will flower, and their Seeds will ripen in Autumn, which, if permitted to shed on the Ground, will come up the following Spring, and flourish without farther Care.

The Seeds of the 3d Sort are sometimes used in Medicine.

The 5th Sort grows naturally in *Tartary*, from whence the Seeds were brought to the Imperial Garden at *Petersburgh*, and have since been dispersed to most Parts of *Europe*; this has a perennial Root, from which springs up many square Stalks, which rise 5 or 6 Feet high, garnished with oblong Leaves deeply cut into 3 Lobes, which are acutely indented on their Edges; these stand opposite on long Foot Stalks. The Flowers are produced from the Wings of the Leaves in long cylindrical Katkins; the male are produced on the lower Part of the Stalk, and the female on the upper; the latter are succeeded by Seeds like those of the Flax inclosed in the three-cornered Empalement of the Flower. This flowers in *July*, and the Seeds ripen in Autumn. The Stalks and Leaves of this Sort are armed with stinging Hairs.

This Plant is easily propagated either by Seeds or

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parting the Roots, and will thrive in most Soils or Situations.

The 6th Sort grows naturally in *Canada* and other Parts of *North America*; it is an annual Plant, with a lucid herbaceous Stalk, which divides into several Branches; these are garnished with oblong sawed Leaves, having 3 longitudinal Veins; they are placed opposite on pretty long Foot Stalks. The Flowers are produced from the Wings of the Stalks in single Katkins which are not divided; they appear late in the Year, and unless the Autumn is very favourable, the Seeds will not ripen in *England*.

The 7th Sort grows naturally in *North America*; this has a perennial Root, from which spring out many Stalks from 2 to 3 Feet high, garnished with oval Spear-shaped Leaves placed opposite, standing on long Foot Stalks; they are crenated on their Edges, and end in acute Points. The Flowers come out from the Wings of the Leaves on every Side the Stalk in long cylindrical undivided Katkins; these appear in *August*, but the Seeds do not ripen in *England*.

The 8th Sort grows naturally in *Canada* and *Virginia*. The Root is perennial; the Stalks rise 2 Feet high; the Leaves are oval, Heart-shaped, and stand alternately on the Stalks; the Flowers come out in branching Katkins from the Wings of the Stalks; these appear toward Autumn, but are not succeeded by Seeds in this Country.

The 2 last Sorts are common in many *English* Gardens, where they are preserved more for the Sake of Variety, than for any Beauty. They may be propagated by parting their Roots in the Spring, and planted in almost any Soil or Situation, and will endure the severest Cold of this Climate in the open Air.

The 9th Sort grows naturally in *China*, where it is titled *Peama*; this is a perennial Plant, sending up many Stalks from the Root, which rise 3 or 4 Feet high, garnished with oval Leaves drawing to Points at both Ends; they are 4 Inches long, and 2 and a Half broad, sawed on their Edges, of a deep green on their upper Side, but very white on their under, and have 5 longitudinal Veins; they are placed alternately, and stand on very long slender Foot Stalks. The Flowers spring from the Wings of the Stalk in loose Katkins; these are not succeeded by Seeds in *England*.

This may also be propagated by parting the Roots, which should be done in *May*, for at that Season this Plant is in its least Vigour, the Winter being the Time when it is most flourishing.

The Plants must be planted in Pots filled with light Earth, and as they are too tender to thrive without artificial Heat in *England*, they should be kept in a temperate Stove, and only exposed to the open Air for 3 Months in the Heat of Summer.

UVA URSI. See *Arbutus*.

VULNERARIA. See *Anthyllis*.

UVULARIA. *Lin. Gen. Pl.* 373.

The Characters are,

The Flower has no Empalement; it has 6 oblong, erect, Spear-shaped Petals, and 6 Awl-shaped Stamina terminated by oblong, erect, four-cornered Summits; it has an oblong, obtuse, three-cornered Germen, supporting a Style longer than the Stamens, crowned by a

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triple, obtuse, spreading Stigma. The Germen afterward turns to an oblong obtuse Capsule, with 3 Lobes and as many Cells, filled with flat orbicular Seeds ranged in a double Order.

The Species are,

1. *UVULARIA foliis amplexicaulis*. Lin. Sp. Pl. 304. *Uvularia* with Leaves embracing the Stalk. *Uvularia foliis cordata-oblongis*. Flor. Leyd. 29. *Uvularia* with oblong Heart-shaped Leaves..

2. *UVULARIA foliis perfoliatis*. Amæn. Acad. 2. p. 3. *Uvularia* with perfoliate Leaves. *Polygonatum ramosum, flore luteo majus*. Cornut. Canad. 38. Branched Solomon's Seal with a large yellow Flower.

The 1st Sort grows naturally in *Bohemia* and *Saxony*. The Root is perennial, but the Stalk is annual; it rises about 2 Feet high, sending out 1 or 2 Branches from the lower Part; it is garnished with oblong smooth Leaves ending in acute Points, whose Bases embrace the Stalks. The Flowers come out singly from the Bosom of the Leaves on long slender Foot Stalks; they are composed of 6 oblong naked Petals of a yellow Colour; these hang downward; they appear the latter End of April, but are rarely succeeded by Seeds here.

The 2d Sort grows naturally in *North America*; this has a perennial Root and an annual Stalk. The Root is composed of many thick fleshy Fibres, from which spring up several Stalks, which for the most part divide

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into 2 at a small Height from the Ground; these spread asunder, and are garnished with oblong, smooth, pointed Leaves, which are broad at their Base, surrounding the Stalk in such a manner, as if the Stalk run through them. The Flowers are composed of 6 oblong yellow Petals ending in acute Points; these stand on slender Foot Stalks which arise from the Bosom of the Leaves, and hang downward. The Flowers appear about the same Time with the Former, but are not succeeded by Seeds in England.

These Plants were first ranged in the Genus of *Polygonatum*, and by Dr. *Boerhaave* they were placed with the *Fritillaria*, but this Title of *Uvularia* was given to it by Dr. *Linnaeus*, from the Resemblance which the Fruit of it has to the *Uvula*.

They are both very hardy Plants, so will live in the full Ground, but as the Flowers have not much Beauty, they are only cultivated for Variety; they are propagated by parting their Roots. The best Season for removing them is about *Michaelmas*, when their Roots may be separated, and planted in the Borders of the Flower Garden, but this should be done every third Year, for if they are often removed, the Plants will not thrive so well, or flower so strong, as when they stand 2 or 3 Years unremoved; they delight in a Soil not too wet or stiff, but a gentle Hazel Loam.

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WACHENDORFIA. Burm.

The Characters are,

The Flowers have oblong acute-pointed Sheaths, ranged alternately upon the Stalks at a Distance from each other; they are permanent and wither, inclosing the Capsule. The Flower has 6 oblong Petals, 3 of the upper spread open, and are erect and joined at their Tails. The 2 side Petals spread each Way, and the lower is the Keel, which is sometimes wanting; it has a protuberant Nectarium placed outward on each Side the upper Petal, and 3 Awl-shaped declining Stamina which are shorter than the Petals, and rest upon the under one, terminated by oblong horizontal Summits which join. It has an oval, blunt, three-cornered Germen situated within the Petals, supporting a single Awl-shaped Style which always bends to the right, crowned by a single Stigma. The Germen afterward turns to an almost oval, three-cornered, hairy Capsule, having 3 Cells, containing 3 oval Seeds fastened to the Placenta, which is in the Center.

The Title of this Genus was given to it by Dr. *John Burman* Professor of Botany at *Amsterdam*, in Honour of Dr. *Everard Jacob Wachendorf*, Professor of Physick, Botany, and Chemistry at *Utrecht*.

We have but one Species of this Genus, viz.

WACHENDORFIA foliis lanceolatis quinque-nerveis canaliculato-spicatis, floribus in thyrsum collectis. Burm. *Wachendorfia* with Spear-shaped Leaves having five plaited channelled Veins, and the Flowers collected in a loose Spike.

This Plant grows naturally at the Cape of Good Hope;

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it has a thick tuberous Reed-like Root of a deep red Colour, sending out many perpendicular Fibres of the same Colour; spreading into several Offsets. The Leaves which rise immediately from the Root are large, Spear-shaped, and channelled; they have 5 plaited Veins, and resemble the Folds in Fans. The largest of these Leaves are 2 Feet long, 3 Inches broad, and of a deep green Colour. The Flower Stalk rises from the Center of the Heads between the Leaves, to the Height of 3 or 4 Feet, and is garnished with Leaves of the same Form with those below, but are narrower, and ranged alternately, embracing the Stalk half round with their Base. The Flowers, when young, are inclosed in Sheaths, which, after some Time, open and make way for the Flowers to come out, then they wither and dry, but remain upon the Stalk like those of the yellow *Asphodel*. The Flowers are produced from the Wings of the Stalk, forming a loose Spike at the Top; there are several sustained upon one common Foot Stalk which open after each other, so that there is seldom more than one open at the same Time upon the same Foot Stalk. The upper Flowers stand almost upright, but the lower nod downward; they are hairy and of a Saffron Colour on the Outside, but smooth and yellow within, having generally 6 Petals; sometimes the lower one is wanting, but then the Place is occupied by the Pointal, which is a singular Sport of Nature. After the Flower fades, the Germen swells to an almost oval, three-cornered, blunt Capsule with 3 Cells, each containing three purple hairy Seeds, fixed to an oblong Placenta.

Dr.

Dr. *Burnian* doubts if this is not the same Species with that Plant which is figured and described by Dr. *Breynius* in the thirty-seventh Plate of his Century, but it is certainly different; for I have raised *Breynius's* Plant from Seeds, which came from the *Cape of Good Hope*, and although there is some Affinity in the Roots and Leaves of both, yet the Leaves of *Breynius's* Plant are much shorter, broader, and deeper channelled, and each Leaf has a Cavity on the upper Edge, which extends half the Length of the Leaf, and is very singular. The Leaves are also hairy whereas those of *Burman's* Plant are smooth. I have not as yet seen *Breynius's* Plant in flower, but by his Figure the Stalk branches out into a Panicle of Flowers much larger than those of *Burman's* Plant, and the Petals are equal. The Flowers have 6 Stamina which spread open upon the Petals, so that it is not of the same Genus, and according to *Linnaeus's* System, not of the same Class.

This Plant is propagated by Offsets, which are sent out from the main Head, after the same Manner as some of the Flag-leaved Irises. These Offsets should be taken off the latter End of *August*, or Beginning of *September* when the Roots are in the most inactive State; these must be planted in Pots filled with soft loamy Earth mixed with a little Sea Sand, and if the Season proves hot and dry, it will be proper to place the Pots where they may have only the Morning Sun, until the Offsets have put out new Roots, for when they are exposed to the full Sun, the Earth will dry too fast, and if the Roots are much watered they are apt to rot; after they have taken new Root, they may be placed in a sheltered Situation, where they may enjoy the full Sun. In this Place they may remain till there is Danger of frosty Mornings; then the Pots should be placed in a hot Bed Frame, with the *Ixias*, and other bulbous and tuberose-rooted Plants from the *Cape of Good Hope*, and treated as hath been directed for them.

WALKS are made either of Gravel, Sand, or Grass; these three Sorts of Walks are the most common in *England*, but where Gravel or Sand cannot be procured, they are sometimes laid with powdered Coal, Sea-coal Ashes, and sometimes of powdered Brick, but these are rarely used, when either Gravel or Sand can be procured; however, where Sea-coal Ashes can be had, it is preferable to the powdered Coal or Bricks, because they bind very hard, and never stick to the Feet in frosty Weather, which is a good Quality, but the Darkness of its Colour has been an Objection to the Use of it in Gardens; however, for Wilderness Walks I think it is preferable to most other Materials, but I shall proceed to give Directions for making the several Sorts of Walks, and first of the Gravel Walks.

In order to the laying of Walks in Gardens, when they are marked out, the Earth should be taken away to a certain Depth, that the Bottom of them be filled with some Lime Rubbish, or coarse Gravel, Flint Stones, or other rocky Materials, which will be serviceable to prevent Weeds from growing through the Gravel, and also to keep away Worm-casts. This

Bottom should be laid 10 Inches or a Foot thick, over which the Coat of Gravel should be 6 or 8 Inches, which Gravel should be fine, but yet not screened, because that spoils it. This should be laid on a Heap, rounding, that the larger rough Stones may run down on the Sides, which being every now and then raked off, the Gravel by that Means will be sufficiently fine.

After the Gravel has been laid to the Thickness above mentioned, then the Walks must be exactly levelled, and raked true from all great Drips, as well as little Holes. By this Means most of the Stones of the Walks will be raked under your Feet, which should rather be gently sprinkled back again, over the last Length that is raked, than buried (as is the Practice of many Gardeners); for by this Means the Walk will be much harder, and the coarsest Stones will very much contribute to its Firmness.

There is also a great Fault committed frequently, in laying Walks too round, and some to that Degree, that they cannot be walked on with that Ease and Pleasure that ought to be; and besides, this too great Rounding takes off much from the seeming Breadth and Beauty of the Walk.

The common Allowance for a Gravel Walk of five Feet Breadth is an Inch Rise in the Crown; so that if a Walk be 20 Feet wide, according to this Proportion, it will be 4 Inches higher in the Middle than on each Side, and a Walk of 25 Feet will be 5 Inches, one of 30 Feet 6 Inches, and so on.

When a Walk has been thus carefully laid, trodden down, and raked, or rather, after every Length or Part of it (which commonly is about 15 Feet each), then it should be rolled well, both in Length and also Cross-ways. The Person who rolls it should wear Shoes with flat Heels, that he may not make Holes in the Walks, for when these are once made in a new Walk, it will not be easy to roll them out again.

In order to lay Gravel Walks firm, it will be necessary to give them 3 or 4 Water Rollings, that is, they must be rolled when it rains so very fast, that the Walks swim with Water; this will cause the Gravel to bind, so that when the Walks come to be dry, they will be as hard as Terrace.

Iron-mould Gravel is accounted the best for binding, or Gravel with a little binding Loam among it, which latter, though it be apt to stick to the Heels of Shoes in hot wet Weather, yet nothing binds better in dry Weather.

When the Gravel is over-sandy or sharp, Loam is frequently mixed with it, which, if they be cast together in Heaps, and well mixed, will bind like a Rock; whereas loose Gravel is as uncomfortable and uneasy to walk on, as any other Fault in a Walk can render it.

The best Gravel for Walks is such as abounds with smooth Pebbles (as is that dug at *Black-beath*) which, being mixed with a due Proportion of Loam, will bind like a Rock, and is never injured by wet or dry Weather, and the Pebbles, being smooth, are not so liable to be turned up, and loosened by the Feet in walking, as are those which are angular and rough; for where Walks are laid with such Gravel as is full of irregular

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Stones, they appear unsightly in a Day's Time after rolling, because the Stones will rise upon the Surface whenever they are walked upon, but the smooth Pebbles will remain handsome 2 or 3 Days without rolling.

Gravel Walks are not only very necessary near the House, but there should always be one carried quite round the Garden, because, being soon dry after Rain, they are proper for walking on in all Seasons; but then these should be but few, and those adjoining to the House ought to be large and magnificent, proportionable to the Grandeur of the House and Garden. The principal of these Walks should be elevated, and carried parallel with the House, so as to form a Terrace; this should extend itself each Way, in Proportion to the Width of the Garden, so that from this there may be a Communication with the Side Walks, without going on the Grass, that there may be a dry Walk continued quite through the Gardens; but there is not a more ridiculous Sight, than that of a strait Gravel Walk, leading to the Front of the House, intersecting the Grass, so as to make it appear like the stiff formal Grass Plats frequently made in little Court-yards by Persons of low Taste.

Grass Walks in Gardens were formerly in great Esteem, and looked upon as necessary Ornaments to a Garden, but of late Years they have justly been banished by every Person of true Taste, for those narrow Slips of Grass were very unsightly, and far from being ornamental, and for the most part useless, being generally too damp for Persons of tender Constitutions to walk upon, and whenever they were constantly used, they became bare in the Places frequently trodden, so were rendered more unsightly; and as the Intention of Walks in Gardens is to have at all Seasons a dry Communication throughout the Garden, for Exercise and Recreation, Grass Walks were very improper, because every Shower of Rain made them so wet, as not to be fit for Use a considerable Time, and the Dews rendered them too damp for Use either in the Morning or Evening; and if the Grass of Walks is not very fine and short, like that of the Downs, it will be very troublesome to walk upon; besides, whenever the Ground is so dry, that Persons may with Safety walk upon Grass, the Lawns and other Parts of Verdure in Gardens are better adapted for Use, than any of those formal stiff Walks, which were so much esteemed in the last Age.

Having given Directions for making Gravel Walks, I shall come next to treat of Sand Walks, which are now very frequently made in Gardens; as being less expensive in the making, and also in keeping, than the former; and in very large irregular Gardens, which are such as most Persons esteem, this is a very great Article; for as the Greatest Part of the Walks which are made in Gardens are carried about in an irregular Manner, it would be very difficult to keep them handsome, if they were laid with Gravel, especially where they are shaded by Trees, for the dripping of the Water from their Branches, in hard Rains, is apt to wash the Gravel in Holes, and render the Walks very unsightly; and when these Wood Walks are of Grass, they do not appear slightly, nor are they very proper for walking on; for after Rain they continue so long damp as to render

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them unfit for Use, and the Grass generally grows spiry and weak for want of Air; and by the continual dropping of the Trees, will by degrees be destroyed; therefore it is much better to lay these Walks with Sand, which will be dry and wholesome; and whenever they appear mossy, or any Weeds begin to grow on them, if they are scuffled over with a *Dutch Hoe* in dry Weather, and then raked smooth, it will destroy the Weeds and Moss, and make the Walks appear as fresh and handsome as if they had been new laid.

In the modern Way of laying out Gardens, the Walks are carried through Woods and Plantations; so that these are shady and convenient for walking in the Middle of the Day. These are usually carried about, winding as much as the Ground will admit of, so as to leave a sufficient Thickness of Wood, to make the Walks private; and that the Persons who are walking in one Part of them, may not be seen by those who are in any of the other Parts. Where these Walks are contrived with Judgment, a small Extent of Ground will admit of a great many Turns; so that a Person may walk some Miles in a small Garden. But these Turns should be made as natural as possible, so as not to appear too much like a Work of art, which will never please so long as the former.

The Breadth of these Walks must be proportioned to the Size of the Ground, which in a large Extent may be 12 or 14 Feet wide; but in small Gardens five or six Feet will be sufficient. There are some Persons who allow a much greater Breadth to their Walks, than what I have assigned to the largest Gardens; but as these Walks are supposed to be shaded by Trees, so, when they are made too broad, the Trees must be planted close to the Sides of the Walks; and then it will be a long Time before they will afford a sufficient Shade, if the Trees are young. Therefore I imagine, the Width here allowed will by most People be thought sufficient, especially as the Walks are designed to wind as much as the Ground will allow; because the wider they are, the greater must be the Turns; otherwise the Walks will not be private for any small Distance. Besides, as it will be proper to line the Sides of these Walks with Honeyuckles, Sweetbriar, Roses, and many other sweet-flowering Shrubs; so the tall Trees should be placed at least 5 or 6 Feet from the Walk, to allow Room for these. But as I shall particularly treat of the Method of laying out Wildernesses, and planting them in such a Manner as to render them as nearly resembling a natural Wood as possible, under its Head, I shall add nothing more in this Place, except a few common Directions for Making these Sand Walks.

When the Ground is traced out in the Manner the Walks are designed, the Earth should be taken out of the Walks, and laid in the Quarters. The Depth of this must be proportioned to the Nature of the Soil; for where the Ground is dry, the Walks need not be elevated much above the Quarters; so the Earth should be taken out 4 or 5 Inches deep in such Places; but where the Ground is wet, the Bottom of the Walks need not be more than 2 Inches below the Surface, that the Walks may be raised so high, as to throw off the Wet into the Quarters; which will render them more dry and healthy to walk on.

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After the Earth is taken out to the intended Depth, the Bottom of the Walks should be laid with Rubbish, coarse Gravel, or whatever of the like Nature can be most readily procured. This should be laid 4, 5, or 6 Inches thick, and beaten down as close as possible, to prevent the Worms from working through it; then the Sand should be laid upon this about 3 Inches thick; and after treading it down as close as possible, it should be raked over, to level and smooth the Surface. In doing this, the whole should be laid a little rounding to throw off the Wet; but there will be no Necessity for observing any Exactness therein; for as the whole Ground is to have as little Appearance of Art as possible, the rounding of these Walks should be as natural, and only so contrived, that the Water may have free Passage from them.

The Sand with which these Walks are laid, should be such as will bind; otherwise it will be very troublesome to walk on them in dry Weather; for if the Sand be of a loose Nature, it will be moved with strong Gales of Wind, and in dry Weather will slide from under the Feet. If after these Walks are laid, they are well rolled 2 or 3 Times, it will settle them, and cause them to be firm. If the Sand is too much inclinable to Loam, it will also be attended with as ill Consequence, as that which is too loose; for this will stick to the Feet after every Rain; so that where Sand can be obtained of a middle Nature, it should always be preferred.

In some Countries where Sand cannot be easily procured, these Walks may be laid with Sea Shells well pounded, so as to reduce them to a Powder, which will bind extremely well, provided they are rolled now and then; but where neither of these can be easily procured, Sea-Coal Ashes, or whatever else can be gotten, which will bind, and be dry to the Feet, may be used for this Purpose; and where any of these can only be had in small Quantities, the Walks should have a greater Share of Rubbish laid in their Bottom, and these spread thinly over them; and in most Places Rubbish, rough Stones, or coarse Gravel, may be easily procured.

W A L L S are absolutely necessary in Gardens, for the ripening of all such Fruits as are too delicate to be perfected in this Country, without such Assistance. These are built with different Materials; in some Countries they are built of Stone, in others with Brick, according as the Materials can be procured best and cheapest.

Of all Materials proper for building Walls for Fruit Trees, Brick is the best; in that it is not only the hand-somest, but the warmest and kindest for the ripening of Fruit; besides that, it affords the best Conveniency for Nailing; for smaller Nails will serve in them, than in Stone Walls, where the Joints are larger; and Brick Walls, with Copings of Free-stone, and Stone Pilasters or Columns, at proper Distances, to separate the Trees and break off the Force of the Winds, make not only the most beautiful, but the most profitable Walls.

In some Parts of *England* there are Walls built both of brick and Stone, which have been very commodious. The Bricks of some Places are not of themselves substantial enough for Walls, nor are they any where so durable as Stone; and therefore some Persons, that they might have Walls both substantial and wholesome, have

built double ones, the Outside being of Stone, and the Inside of Brick, or a Stone Wall lined with Brick; but when these are built, there must be great Care taken to bind the Bricks well into the Stone, otherwise they are very apt to separate one from the other; especially when Frost comes after much Wet; which swells the Mortar, and frequently throws down the Bricks, when the Walls are only faced with them, and not well tied into the Stone.

Where the Walls are built entirely of Stone, there should be Trelases fixed up against them, for the more convenient fastening the Branches of the Trees; the Timbers of these Espaliers need not be more than an Inch and a Half thick, and about two Inches and a Half broad; these should be fixed cross each other, at about 4 Inches Distance; for if they are at a much greater Distance, it will be difficult to fasten the Shoots of the Trees properly. As this Trelase will be laid close to the Wall, the Branches of the Trees will lie about two Inches from the Wall; in which Position the Fruit will ripen better than when it lies quite close to the Wall; so that where Stone Walls are built, there should always be these Espaliers framed against them, which will render these Walls very good for Fruit Trees, which, without the Espaliers, seldom are found to answer the Purpose of ripening the Fruits well; besides the Inconvenience of having no good Fastening for the Branches of the Trees.

There have been several Trials made of Walls built in different Forms; some of them having been built semicircular, others in Angles of various Forms, and projecting more towards the North, to screen off the cold Winds; but there has not been any Method as yet, which has succeeded near so well, as that of making the Walls strait, and building them upright.

The fairest Trial which I have seen made of circular Walls, was at *Goodwood* in *Suffex*, the Seat of the Duke of *Richmond*, where, in the Middle of two South Walks, there were two large Segments of Circles, in which there were the same Sorts of Fruit Trees planted, as against the strait Parts of the Walls; but there never was any Fruit upon the Trees in the circular Part of the Walls, which came to Maturity; nor were the Trees of long Continuance, being blighted every Spring; and in a few Years were totally destroyed; and when the Branches of those Trees, which grew upon the strait Parts of the Walls, had extended themselves so far, as to admit of their being led into the circular Parts of the Walls, they were constantly blighted and killed.

When the Trees which had been planted in the circular Parts were destroyed, the Walls were filled with Vines; but the Grapes of the same Sort were a full Month later than those growing against the strait Parts of the Walls; so that they rarely ripened, which occasioned their being rooted out and Figs were afterwards planted; but the Fruit of these succeeded little better; nor can it be supposed, that any Trees or Plants will thrive so well in these Circles, where there is a constant Draught of Air round them, which renders the Situation much colder than the open Air.

I have also seen at Mr. *Le Cour's* Garden in *Holland*, some Walls built in Angles of different Forms; but these succeeded no better than the Circles before mentioned;

stoned; for I did not find one Tree in Health against the Walls; nor did they produce Fruit.

There are several other Schemes which have been proposed by different Persons, for building Walls to accelerate the ripening of Fruits; among which there was a very ingenious Book written some Years ago, intitled, *Fruit Walls improved, by inclining them to the Horizon*; in which the Author has shewn, by Calculation, that there will a much greater Number of the Rays of the Sun fall upon such Walls, than upon those which are built perpendicular; and from thence has drawn Calculations, that Walls so built will be of great Service in the accelerating of Fruit; and he has taken the Trouble of calculating the different Inclinations, which such Walls should have in the different Climates, in order to receive the greatest Number of the Sun's Ray's. This Theory seems to have all the Demonstration necessary for its Support; but upon Trial has not succeeded in the least; for as these Walls must be built against Banks of Earth, the Damps which arise from the Ground overbalance the Advantage of the Sun's Ray's; besides, these sloping Walls being more exposed to the cold Dews in the Night, the Fruit will be much more chilled thereby; and in the Spring the Morning Frosts will prove much more destructive to the tender Blossoms of the Fruit Trees, as they will be more exposed to them, than against an upright Wall; add to this their being much more exposed to the Winds and the Rain, and it will be found, by comparing the Advantages proposed from these Walls, with the Disadvantages to which the Fruit Trees will be exposed, that upright Walls will have the Preference; for it is not the strongest Rays of the Sun, in the Heat of Summer, which are so much wanting for ripening of Fruit, as the Continuance of a moderate Share of Warmth; and above all, the having the Sun in a Morning, to dry off the cold Dews of the Night early, is of the greatest Use; and in this respect the upright Walls are much preferable to the sloping, as they will have the direct Rays of the Sun in the Morning, which will be oblique on the other, and renders those Walls which are built inclining to the East preferable to South Walls; as the Fruit will always ripen earlier against them.

There are some Persons who recommend the painting of Walls black, or of a dark Colour; as they suppose the dark Colour will imbibe more of the Sun's Rays, so will retain the Warmth longer; this also answers better in Theory than in Practice; for although it must be allowed, that a black Wall is warmer to the Touch than a common Brick Wall, yet, as the Fruit generally is situated at a small Distance from the Wall, it receives no Benefit from the Warmth of the Wall; and it is the reflected Heat which accelerates the ripening of Fruit; therefore I would advise every one to make fair Trials of these Things, before they put them in Practice, and not to take upon Trust what they may be told by Persons who are too sanguine in recommending to others Schemes which they have adopted upon very slight Principles, or perhaps upon a single Trial; this Painting of the Walls is recommended by the same Person who wrote upon inclining Walls; and he has proposed this upon the same Principles; but introducing these Schemes

should be avoided, until sufficient Trials be made to warrant their Use.

Where Persons are willing to be at the Expence, in the building their Walls substantial, they will find it answer much better than those which are slightly built, not only in their Duration, but also in their Warmth; therefore a Wall two Bricks thick, will be found to answer better than one Brick and a Half; and if in the building of Garden Walls they are grouted with soft Mortar, to fill and close all the Joints, the Walls will be much stronger, and the Air will not so easily penetrate through them, as it does through those which are built in the common Way.

According to the modern Taste in Gardening, there are very few Walls built round Gardens; which is certainly very right, not only with regard to the Pleasure of viewing the neighbouring Country from the Garden, but also in regard to the Expence, 1. Of building these Walls; 2. If they are planted with Fruit, as is frequently practised, to maintain them will be a constant Charge, without receiving much Profit or Pleasure; for when there is too much Walling planted with Fruit Trees, they are seldom taken much care of; so that the Quantity of Fruit produced will be small, and that ill-nourished and bad-tasted; therefore the Quantity of Walling should be proportioned to the Fruit consumed in the Family; but as it will be necessary to inclose the Kitchen Garden, for the Security of the Garden Stuff, so, if that be walled round, it will contain as much Fruit as will be usually wanted in the Family; because the Kitchen Garden is always proportioned to the Number of Persons maintained; but if the Quantity of Walling which surrounds the Kitchen Garden should be judged too little for the Supply of Fruit, there may be a cross Wall built through the Middle of the Kitchen Garden; or, where the Size of the Garden will admit, there may be two cross Walls built; but this must not be done where there is not Room to place the Walls at least 80 Feet asunder; and if they are allowed a much greater Distance it will be better, and as the Kitchen Garden should always be placed out of Sight from the House, the Walls may be hid by Plantations of Trees, at some little Distance, which will be of Use in sheltering the Fruit.

The best Aspect for Walls in England is, to have one Point to the Eastward of the South; for these will enjoy the Benefit of the Morning Sun, and will be less exposed to the West and South-west Winds (which are very injurious to Fruits in England) than those Walls which are built due South. I know there are many Persons who object to the turning of Walls the least Point to the East, on Account of the Blights which they say come from that Quarter in the Spring; but from many Years Experience and Observation, I can affirm, that Blights as often attack those Walls which are open to the South-west, as those which are built to any other Aspect; and I believe, whoever will be at the Trouble to observe for 7 Years, which aspected Walls suffer most from Blights, will find those which are built with a Point to the Eastward of the South, as seldom blighted, as those which are turned to any other Aspect; therefore, in the Contrivance of a Kitchen Garden, there

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should be as great Length of these Walls built, as the Situation of the Ground will admit.

The next best Aspect is due South, and the next to that South-east, which is preferable to the South-west, for the Reasons before assigned; but as there will, for the most Part, be South-west, and West Walls in every Garden; these may be planted with some Sorts of Fruit, which do not require so much Heat to ripen them, as those designed for the best Walls; but wherever there are North Walls, those will only be proper for Baking Pears, Plums, and Morello Cherries for preserving, or some Duke Cherries may be planted against these Walls, to continue them longer in the Season, which will be found useful in supplying the Table till Peaches, Nectarines, and Plums, are ripe.

Where Persons are very curious to have good Fruit, they erect a Trelase against their Walls, which projects about two Inches from them, to which they fasten their Trees; which is an excellent Method, because the Fruit will be at a proper Distance from the Walls, so as not to be injured by them, and will have all the Advantage of their Heat; and by this Method the Walls will not be injured by driving Nails into their Joints, which by every Year being drawn out, draws out the Mortar from between the Bricks, and thereby makes Holes, in which Snails and other Vermin will harbour and destroy the Fruit, and the Walls will be also greatly impaired.

These Trelases may be contrived according to the Sorts of Fruit which are planted against them. Those which are designed for Peaches, Nectarines, and Apricots (which, for the most part, produce their Fruit on the young Wood), should have their Rails three, or at most four Inches asunder every Way; but for the other Sorts of Fruit, which continue bearing on the old Wood, they may be five or six Inches apart; and those for Vines may be eight or nine Inches Distance. For as the Shoots of Vines are always trained at a much greater Distance, than those of any other Sort of Fruit. The Trelases for these need not be near so close, especially as those must for Peaches and Nectarines, whose Shoots are generally shortened to about five or six Inches or less; so that if the Rails are not pretty close, many of the short Branches cannot be fastened to them.

These Trelases may be made of any Sort of Timber according to the Expence which the Owner is willing to bestow; but Fir is most commonly used for this Purpose, which, if made of yellow Deal, well dried and painted, will last many Years; but if any Person will go to the Expence of Oak, it will last found much longer. And if any one is unwilling to be at the Expence of either, then a Trelase may made of Ash Poles, in the same Manner as is practised in making Espaliers for Counter Borders; with this Difference only, that every fourth upright Rail or Post should be very strong, and fastened with Iron Hooks to the Wall, which will support the Whole; and as these Rails must be laid much closer together, than is generally practised for Espaliers, these strong upright Rails or Posts will not be farther distant than three, or at most four Feet from each other. To these the cross Rails which are laid horizontally should be well nailed, which will secure them from being displaced, and also strengthen the Trelase;

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but to the other smaller upright Poles they need only be fastened with Wire. To these Trelases the Shoots of the Trees should be fastened with Osier Twigs, Rope Yarn, or any other soft Bandage, for they must not be nailed to it, because that will decay the Wood Work.

These Trelases need not be erected until the Trees are well spread, and begin to bear Fruit plentifully; before which Time the young Trees may be trained up against any ordinary low Espaliers, made only of a few slender Ash Poles, or any other slender Sticks; by which Contrivance the Trelases will be new when the Trees come to bearing, and will last many Years after the Trees have overspread them; whereas, when they are made before the Trees are planted, they will be half decayed before the Trees attain half their Growth.

Where these Trelases are intended to be made against new Walls, it will be proper to fasten some strong Iron Hooks into the Wall as it is built, at the Distance which the upright Posts are intended to be placed; because when these are afterwards driven into the Wall, they displace the Mortar in the Joints, and injure the Wall.

In building the Walls round a Kitchen Garden, the Infides, which are designed to be planted with Fruit Trees, should be made as plain as possible, so that the Piers should not project on those Sides above 4 Inches at most; and these should be placed about 14 Feet asunder, in such Walls as are designed for Peach and Nectarine Trees; so that each Tree may be planted exactly in the Middle between the Piers, which will render them more sightly, and be better for the Trees; but where Apricots, Plums, or Cherries, are to be planted, the Piers may be only 10 Feet asunder; and against every other Pier the Trees should be planted which will allow them sufficient Room to spread; as the Trelase will project as forward as the Piers, the Branches of the Trees may be trained on a Plain; but when the Piers project no more on the Inside of the Garden, they should be built stronger on the Outside, for the better supporting the Walls.

The usual Thickness which Garden Walls are allowed, if built with Bricks, is 13 Inches, which is one Brick and a Half; but this should be proportionable to the Height; for if they are built 12 or 14 Feet high or more, as is often practised, then the Foundations of the Walls should be at least two Bricks, and a Half thick, and brought up a Foot or more above the Level of the Surface of the Ground, of the same Thickness; then they should be set off 2 Inches on each Side, which will reduce them to two Bricks; and 5 or 6 Feet above the Surface of the Ground, they may be diminished on each Side, to reduce them to the Thickness of a Brick and a Half, which must be continued to the Top of the Walls, and the Piers in these high Walls should also be proportionably stronger than is commonly allowed to lower Walls; for as these will be much more exposed to strong Gales of Wind, if they are not well built, they will be in Danger of being blown down; therefore the Piers of these Walls should be projected the Length of a Brick on their Backside, and the Thickness of a Brick on their Front; and if these are built about 10 or 12 Feet asunder, they will greatly strengthen the Walls.

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But there is no Necessity for building Walls higher than 9 or 10 Feet; unless it be for Pears, which, if properly managed, will spread over a great Compass of Walling; but as only some of the latest Winter Pears require the Assistance of a Wall, there need no more but that Part of the Wall where these are designed, to be built higher; for Peaches and Nectarines never require a Wall higher than 9 or 10 Feet, provided they are rightly managed; because whenever they are carried to a greater Height, the lower Part of the Wall is unfurnished with bearing Branches, and although Apricots, Plums, and Cherries, will frequently grow higher, yet, if they are planted at a proper Distance, and the Branches trained horizontally from the Bottom, they will not soon cover a Wall of this Height; and Vines may be kept as low as any Sort of Fruit; for when they are planted against low Walls, they must be treated somewhat after the same Manner, as those in Vineyards; which is, to cut out the greatest Part of the Wood which produced Fruit the preceding Year, and train in new Shoots for the next Year's Bearing, which are rarely left a Yard in Length; therefore will not require very high Walls.

If the Pears which are designed to be planted, are allowed a South-west Aspect, they will ripen very well; then the Wall to this Aspect should be built 14 Feet high or more, for as these Trees spread very far, when on free Stocks, they should not be shortened and stopped in their Growth, which will prevent their Bearing, by causing them to send out a great Number of gross luxuriant Shoots, which will never produce Fruit; therefore these should never be planted among other Sorts of Fruit Trees, which are of less Growth; because then the Walls must appear very unsightly, in having some Trees planted more than double the Distance which the others require; so that there is no other Sort of Fruit which requires the Assistance of Walls to ripen their Fruit, which need so great Room for spreading as Pears, except it be Figs, a few Trees of which may be planted against the same Walls where there is Room; though these may be planted against the back Walls of Offices or Stables, where there is Conveniency, because this Fruit is seldom coveted by Servants; and being planted in Places which are much frequented, they will not be in so much Danger of being destroyed by Birds, as those which are in private Places. But I shall now proceed to give some Directions for the building of hot Walls, to accelerate the ripening of Fruits, which is now pretty much practised in England.

In some Places these Walls are built at a very great Expence, and so contrived as to consume a great Quantity of Fuel; but where they are judiciously built, the first Expence will not be near so great, nor will the Charge of Fuel be very considerable; because there will be no Necessity of making Fires more than 10 Weeks or 3 Months; beginning about the Middle or latter End of *January*, and ending by the Middle of *May*, when there will be no Want of Fires, if the Glasses are close shut every Night, or in bad Weather; for half an Hour's Sun-shine on the Glasses at that Season, will sufficiently warm the Air inclosed in the Glasses, for the Growth of any of our *European* Fruits.

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There are some Persons who plant Vines, and other Fruit Trees by the Sides of Stoves, and draw some of their Branches into the Stove, in order to obtain early Fruit; but this is by no Means right; where the Stove is designed for the Ananas, the Air must be kept much warmer for them, than is required for any of the other Fruits; so that they can never succeed well together; for when there is only a sufficient Quantity of Air admitted for the Growth of the other Fruit, the Ananas are starved for Want of proper Heat; and so on the contrary, when the Stove is kept up to the proper Heat for the Ananas, it will be too hot for other Fruits; and it will also be proper to have the Vines on a particular Wall by themselves, because these require to have a greater Share of Air admitted to them, when they begin to shoot, than some other Sorts of Fruit, so that it is by much the better Method to have them separate.

The ordinary Height of these hot Walls is about 10 Feet, which will be sufficient for any of those Sorts of Fruits which are generally forced; for by forcing the Trees, they are commonly weakened in their Growth, so that they will not grow so vigorously as those which are always exposed to the open Air; and where there is not a Quantity of Walling planted sufficient to let one Part rest every other Year, the Trees will never be very healthy, and will last but a few Years. The Quantity of Walling to produce early Fruit for a middling Family, cannot be less than 80 or a 100 Feet in Length; therefore where a Person is desirous to have the Fruit in Perfection, and the Trees to continue in a good Condition many Years, there should be three Times this Quantity of Walling built; so that by dividing it into 3 Parts, there will be two Years for the Trees to recover their Vigour between the Times of their being forced; whereby a greater Quantity of bearing Wood may be obtained, and the Fruit will be fairer, and in larger Quantities, than when they are forced every Year, or every other Year; and as the Glasses may be contrived so as to move from one to the other, the Expence of building the Walls so much longer, will not be very great, because the Frames and Glasses will be the same as for one Year's Fruit.

The Foundations of these Walls should be made 4 Bricks and a Half thick, in order to support the Flues; otherwise, if Part of them rest on Brick Work, and the other Part on the Ground, they will settle unequally, and soon be out of Order; for where-ever there happen any Cracks in the Flues, through which the Smoke can make its Escape, it will prevent their drawing; and if the Smoke gets within the Glasses, it will greatly injure the Fruit. This Thickness of Wall need not be continued more than 6 Inches above the Ground, where should be the Foundation or Bottom of the first Flue; which will raise it above the Damps of the Earth; then the Walls may be set off 4 Inches on each Side, which will reduce it to the Thickness of three Bricks and a Half, so that the back Wall may be two Bricks thick, which is absolutely necessary to throw the Heat out more in Front; for when the back Walls are built too thin, the Heat will escape through them. The Wall in Front next to the Fruit, should be only 4 Inches thick; whereby there will be Allowance of 9 Inches for the Flues, which may be covered with 12
Inch

Inch Tiles; for if they have an Inch and a Half Bearing on each Side, it will be sufficient.

The Ovens in which the Fires are made, must be contrived on the Backside of the Walls, which should be in Number proportionable to the Length of the Walls. The Length usually allowed for each Fire to warm, is 40 Feet; though they will do very well for 50 Feet; but I would not advise the Flues to be longer than this to each Fire, because when the Ovens are made at a great Distance, there is a Necessity of making the Fires so much stronger to warm the Walls, which will occasion the Heat to be too violent near the Fires. These Ovens should be shewed over, to keep out the Wind and Rain; otherwise the Fires will not burn equally. Some People make these Sheds of Timber, but it is much better to build them of Brick, and tile them over; because the wooden Sheds will in a few Years decay, and afterwards will be a constant Charge to keep in Repair; and besides they may be in Danger of firing, if great Care is not constantly taken of the Fires. As it is absolutely necessary to have the Ovens below the Foundation of the first Flues, there must be Steps down into the Sheds, to come to the Mouth of the Ovens to supply the Fuel; therefore the Sheds should not be narrower than 8 Feet in the Clear; for as the Steps will require 4 Feet Space, there should be at least 4 Feet more for the Person who attends the Fire, to have Room to turn himself to clear out the Ashes, and to put in the Fuel. Where the Length of Walling requires 2 Ovens, it will be proper to have them in the Middle included in one Shed, which will save Expence, and allow more Room to attend the Fires; for in this Case the Sheds must be at least 10 Feet long, and then they need not be more than 6 in Breadth. The Steps down into these should be at one End; so that the Door opening into the Sheds, will not be opposite to the Mouths of the Ovens, therefore the Fires will burn more regular; for whenever the Doors are contrived to front the Mouth of the Ovens, if the Wind sets directly against them, it will cause the Fire to burn too fiercely, and the Fuel will be soon consumed.

These Ovens may be contrived in the same Manner as those which are already described for Stoves; wherefore I shall not repeat it again in this Place; but must observe, that when the two Ovens are joined together, there should be a Partition Wall at least three Bricks thick between them, otherwise the Fires will soon destroy it; and if there should be the least Hole in the Wall, through which the Smoke of the 2 Fires can communicate, it will prevent their drawing.

The lower Flue, through which the Smoke first passes from the Fire, may be 2 Feet and a Half deep; therefore the back Wall should be at least 2 Bricks thick, as high as to the Top of this Flue; and then it may be set off to a Brick and a Half Thickness, which must be continued to the Top of the Wall. The second Flue, which should return over the first, may be made 2 Feet, the third a Foot and a Half, and the fourth one Foot deep; which 4 Flues, with their Coverings, will rise near 8 Feet in Height; so that there will be about two Feet left for the fixing the Frames at the Top to support the Glasses, and for coping the Wall. And these 4 Returns will be sufficient to warm

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the Air in the Frames; for the Smoke will have lost its Heat by the Time it has passed thus far.

In carrying up these Walls, there should be some strong Iron Hooks fastened at convenient Distances, which should project about 2 Inches from the Wall, to which the Trelase must be fastened, which is to support the Trees. These Hooks should be long enough to fasten into the back Wall; for the Wall in Front, being but 4 Inches thick, will not be strong enough to support the Trelase; but in placing them, Care should be taken not to lay them cross the Middle of the Flues, because they would obstruct the clearing the Flues of Soot, whenever there should be Occasion; so that the best Way is to lay them just under the Tiles which cover each Flue, at about 3 Feet asunder, which will be near enough, provided the Hooks are made sufficiently strong. As the Flues must be well plastered with Loam on their Inside; so likewise should the Loam be spread under the Tiles, which cover them, to the Thickness of the Hooks, that the Flues may be very smooth; otherwise the Soot will hang to the Iron Hooks, and stop the Smoke from passing. It will also be very proper to cover these Flues on the Side next the Trelase with Hop Bags, or some such coarse Cloth, as hath been directed for the Stoves; which will make them so tight, that no Smoke will find its Way, which, without this Covering, it is very apt to do, through the Joints of Walls; especially when they are so thin as these must be built; and this Covering will also strengthen the Wall of the Flues, and join the whole Work together. If at each End of these Flues, there are small Arches turned in the back Walls, in such a Manner that there may be Holes opened to clean the Flues of Soot, whenever there is a Necessity for it, the Trouble will be much less than to open the Flues in Front; and there will be no Damage done to the Trees, nor will the Flues be in the least injured by this, which they must be, when they are opened in Front.

The Borders, in Front of these hot Walls, should be about 4 Feet wide, which will make a sufficient Declivity for the sloping Glasses; and in these Borders there may be a Row of Dwarf Peas planted to come early, or a Row of dwarf Kidney Beans, either of which will succeed very well; and if they are not planted too near the Trees, will not do them much Injury. On the Outside of these Borders should be low Walls erected, which should rise about an Inch or two above the Level of the Borders; upon which the Plank of Timber should be laid, on which the sloping Glasses are to rest; and this Wall will keep up the Earth of the Border, and also preserve the Wood from rotting.

The Glasses which are designed to cover these Walls, must be divided into 2 Ranges; for as they must reach from the Ground Plank (just above the Level of the Border) to almost the Top of the Wall, they will be more than 12 Feet long; which will be too great a Length for single Frames, which, when they are much more than 6 Feet long, are too heavy to move, especially if the Frames are made of a proper Strength to sustain the Glass. These Frames should be contrived in such a Manner, that the upper Row may slide down; and by making on one Side 3 small Holes in the Wood Work which supports the Frames, at about a Foot Distance,

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and having a small Iron Pin to fix into them, the top Glasses may be let down 1, 2, or 3 Feet, according as there may be Occasion to admit Air. The lower Row of Glasses may be contrived so as to take easily out; but as they must lie sloping, and the upper Row must bear on them, they cannot be contrived to slide upwards; nor indeed will there be any Occasion for their moving; because it is much better to let the Air in at the Top, than in the Front of the Trees.

The sloping Timbers, which are to support the Glass Frames, must be fastened at Bottom, into the Ground Plate in the Front of the Border, and at the Top into strong Iron Cramps fixed in the upper Part of the Wall for that Purpose. These Timbers should be made of Firr, which will not twist as Oak and some other Wood will, where it is laid in such Position. They must be made substantial, otherwise they will not last many Years, especially as they are designed to be moveable. On the Top of these should be fixed a strong Board, under which the upper Row of Glasses should slide. The Use of this Board is, to secure the upper Part of the Glasses from being raised by the Winds, and also to keep the Wet from getting to the Trees; therefore it should be joined as close as possible to the Wall, and should project about 2 Inches over the Glass Frames; which will be enough to throw the Wet on the Glasses, and likewise to secure them fast down.

The Breadth of these Frames for the Glasses may be about 3 Feet or a little more, according as the Divisions of the Length of the Wall will admit; for a small Matter in their Width is of no Consequence, provided they are not too wide to be easily moved; for when they are wider than a Man can easily reach with his Arms to manage, they will be very troublesome to carry from one Place to another. The Bars of these Frames, which are to support the Glass, should be placed lengthwise of the Frames; for when they are placed across, they stop the Moisture which is lodged on the Inside of the Glasses, and cause it to fall in Drops on the Borders at every Bar; which will be very injurious to any Plants which are put there; and if it falls on the Trees will greatly damage them, especially when they are in Blossom. The Lead into which the Glasses of these Frames are fixed, should be very broad, and the Joints well cemented; otherwise the Wet will find an easy Passage through, and do great Damage to the Fruit.

At each End of the Range of Glasses, there will be an angular Space between the Glasses and the Wall, which must be closely stopped to prevent the Air from getting in, which might greatly injure the Fruit. These are by some Persons closely boarded up; but if they are closed with Glasses, so contrived as to open to let in Air at proper Times, it will be of great Advantage; because when the Wind may be too strong against the Front Glasses, one or both of these End Glasses may be opened, according to the Warmth of the Air inclosed; which will be often very useful to cool the Air, and to admit a small Quantity of fresh Air to the Fruit.

The Sorts of Fruit, which are usually planted for forcing, are Cherries, Plums, Peaches, Apricots, and Nectarines; but the two last-mentioned rarely succeed well; nor will the Trees continue long; so that they are scarce worth planting against hot Walls. As for the

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Vines, I would propose they should be planted by themselves against a particular Wall; for as they will require more Air to be admitted to them when they begin to shoot, than any of the above mentioned Fruits, they will not all succeed, if they are included in the same Frame. As to the others, they will do very well in the same Border, and will demand the same Temperature of Warmth. The best of these Sorts to plant against these hot Walls, are those here mentioned:

Cherries.

The Early May, and May Duke.

Plums.

The *Faune Hative*, or White Primordian.

The Early Black Damask, or Morrocco.

The Great Damask Violet of *Tours*.

The *Drap d'Or*.

The *Faune Hative* Plum is here mentioned, because it is ripe the first, but it is a mealy Fruit without Flavour, therefore scarce deserves a Place.

Peaches.

The Red Nutmeg.

The Red *Magdelain*.

The *Montauban*.

Nectarines.

Fairchild's Early Nutmeg.

The Elruge.

Apricot.

The Masculine.

These being the Sorts which ripen early, are the most proper to plant against these Walls, although they are not so valuable as some other Sorts of these Fruits; yet, as they naturally ripen 3 Weeks or a Month earlier in the Season, they will be very early ripe, when they are brought forward by artificial Warmth.

In preparing the Borders for planting these Fruit Trees, there should be the same Care taken, as for those against open Borders; which, being fully treated of in another Part of this Work, I shall not repeat here. There must also be the same Care in training up the Trees, when they shoot; but the Trelases need not be made against these Walls, until the Trees are grown large enough to spread, and produce a Quantity of Fruit; till which Time they may be supported by any low ordinary Trelase, which will do very well till the Time that the Trees will have Strength enough to force, which will not be until the 4th or 5th Year after planting, according to the Progress they have made; for if they are forced too young, it will weaken them so much, that they seldom make vigorous Trees afterward; besides, the Quantity of Fruit which such young Trees produce, is not worth the Expence and Trouble of forcing; for the Quantity of Fuel used, and the Trouble, will be the same for small Trees, which are not capable of producing more than 6 or 8 Fruit each, as for those which may produce 3 or 4 Dozen; so that the greater Time the Trees have to grow before they are forced, the better they will pay for the Trouble and Expence.

But it will be the best Way not to have any of the Frames made, nor the Trelase, or any other of the Wood Work, until the Trees are strong enough to force; for if these are done when the Walls are first built, as is by some Persons practised, they will be half decayed, before there is any Use for them; but then the Persons

who

who are employed in making the Trelase, must be very careful in putting it up, not to injure the Trees.

When the Trees have acquired Strength enough to produce a Quantity of Fruit, that Part which is designed to be forced the following Spring, should be carefully pruned early in Autumn; when the very weak Shoots must be either entirely cut out, or pruned very short, because these, by being forced, will for the most part decay; and though some of them may be full of Flower Buds, yet these Shoots, being weak, cannot nourish them; so that the Flowers having exhausted all the Sap, the Shoots die soon after, and rarely produce any Fruit, or at least do not bring them to Perfection. The other more vigorous Shoots should also be shortened to a proper Length, after the same Manner as is directed for those Trees in the open Air; with this Difference only, viz. that these which are designed for forcing, should not have their Shoots left so long, because forcing them will weaken them; and consequently, should there be as great a Length of Branches, there will probably be a greater Number of Fruit on them; because, as these will be screened from the open Air, they will not be liable to Blasts, or the Injuries of Frost; and the having too many Fruit on the Trees, will render them small, and also too much weaken the Trees; then the Shoots should be all regularly fastened to the Trelase, at a proper Distance from each other; so that when the Branches shoot the following Spring, they may not overhang each other. The Reason for my advising these Trees to be pruned so early in the Season, is, that those Branches which are left on, may enjoy the whole Nourishment of the Sap; so that the Buds will become very turgid during the Winter Season, and will be prepared to open when the Fires are set to work.

The Time for beginning to make the Fires is about the Middle or latter End of *January*, according as the Season is more or less favourable; for if the Trees are forced too early into flower, they will be in some Danger of miscarrying, if the Weather should prove severe, so that it is by much the surest Method to begin about the Time here directed, because there will be a Necessity of admitting fresh Air to the Trees when they are in flower; which cannot be done with Safety, when they flower in very bad Weather. And those Trees which are forced into flower by the Middle of *February*, will ripen their Fruit as early as most People will desire to eat them; for the Cherries will ripen early in *April*, and the Apricots by the Beginning of *May*; and soon after, the Plums, Peaches and Nectarines, will be ripe.

There are some Persons who plant Strawberries in their Borders before the Fruit Trees, in order to have early Fruit, which often succeed very well; but wherever this is practised, great Care should be taken to keep them from spreading over the Border, because these Plants will exhaust the principal Goodness of the Earth, and thereby injure the Trees; so that when it is designed to have Strawberries in these Borders, I would advise, that the Roots should be either planted in Pots, or singly at a good Distance on a shady Border of loamy Earth, one Year before they are designed to be forced; during which Time the Runners should be diligently pulled off, to encourage the main Roots for fruiting; and at *Michaelmas* these Plants may be transplanted,

with large Balls of Earth to their Roots, into the Borders, before the Fruit Trees which are to be forced the following Spring; so that they may have Time to get new Root before that Season; and if these Plants are carefully watered when they begin to shew their Flower Buds, they will produce a good Quantity of Fruit, which will ripen the latter End of *April*, or the Beginning of *May*; but then I would also advise, that these Plants be taken away as soon as they have done bearing, that they may not rob the Trees of their Nourishment.

Since I have mentioned this Method of having early Strawberries, I shall take the Liberty to insert another Method, which is often practised to obtain this Fruit early in the Spring, though it doth not so properly come under this Article; which is, to train up the Plants either in Pots or Borders, after the Manner before directed, for at least one Year or more; then, about the Beginning of *February*, there should be a moderate hot Bed prepared, in Length proportionable to the Number of Plants designed to be forced; and the Breadth should be proportionable to the Width of the Frames which are designed to cover them. These Frames may be such as are used for common hot Beds, to raise the early Cucumbers, &c. This hot Bed must be covered with fresh loamy Earth about 8 Inches thick, into which the Strawberry Plants should be placed, with large Balls of Earth to the Roots, as close as they can conveniently be planted (for as they must be kept clear from Runners, they will not spread much during the Time they remain in the Bed, which will be no longer, than until their Fruit is gone). Then they should be gently watered to settle the Earth to their Roots, which must be frequently repeated as the Earth becomes dry, otherwise they will produce but few Fruit. While the Nights continue cold, the Glasses of the hot Bed should be covered with Mats, to preserve a kindly Warmth in the Beds; but in the Day Time, when the Weather is favourable the Glasses should be raised to admit fresh Air to the Plants; for if they are too much drawn (especially when they begin to flower), they will not produce much Fruit. If the Season should continue long cold, and the Heat of the Beds should decline, it will be proper to lay some fresh hot Dung round the Sides of the Beds to renew their Heat, being always careful not to make them too hot; for that will scorch their Roots, and prevent their fruiting. If the Plants which are planted in these Beds are strong, and in a good condition for bearing; and Care be taken in transplanting them to preserve good Balls of Earth to their Roots, and also to keep a due Temperature of Warmth in the Beds; they will produce ripe Fruit by the End of *April*, or the Beginning of *May*, in Plenty; and will continue bearing, until some of those in the open Air come in to succeed them.

The best Kinds of Strawberries to plant for forcing, are the Scarlet; for the Hautboys grow too rampant for this Purpose.

But to return to the Subject of hot Walls; what I have here inserted concerning the forcing of Fruits, has been only to obtain these Fruits earlier in the Season, than they would naturally ripen against common Walls. But in some Part of *England*, where most of our good Kinds of Fruit seldom ripen, it might be very well

worth while to build some of these Walls, to obtain good Fruit from the best Kinds of Peaches, Plums, &c. especially in such Places where Fuel is Plenty, because there the Expence will not be great after the first Building of the Walls. For I would not propose to have Coverings of Glass, excepting for a small Proportion of the Walls; the rest may have Frames of Canvas, to shut over them, in the same Manner as the Glasses are contrived; which will succeed very well, where proper Care is taken: for as there will not be Occasion to cover these Trees until the Beginning of *March*, at which Time also the Fires must be made; so, before the Trees are in flower, the Weather may be frequently warm enough to open the Covers to admit Sun and Air to the Trees in the Middle of the Day; for if these Covers are kept too closely shut, the Shoots of the Trees will draw very weak, and their Leaves will turn pale, for Want of Light and Air. And as the Design of these Contrivances is only to bring the Trees into flower three, or, at most, four Weeks earlier, than they would naturally come against common Walls, there will be no Necessity for making very large Fires, or keeping the Covers too closely over the Trees.

Instead of Canvas for these Covers, oiled Papers may be used, which should be done in the Manner directed for raising Melons, by pasting as many Sheets of Paper together, as will fit the Frames on which they are to be fixed; and when the Paste is dry, the Paper should be fastened into the Frames, and then the Oil rubbed over on the Outside with a Brush, which will soak through the Paper, and when the Paper is dry, the Covers may be used. This Paper will last very well one Season, and the Expence of repairing it will not be very great; wherefore these are to be preferred to the Canvas, because all Sorts of Plants will thrive much better under them, than they will under Canvas, or any other close Covering, which will not admit the Rays of the Light so well through to the Plants.

The Frames designed for either Canvas or Paper may be made much slighter than those for Glass, because these, being very light, will not require so much Strength to support them; and if these are well painted, and every Year, when their Use is over, carried into Shelter, they will last a long Time, for they will not be wanted abroad longer than three Months, viz. from the Beginning of *March* to the End of *May*; for after this Time the Fruit will not require any Covering, the Trees being then full of Leaves, and the young Shoots will by that Time have made such Progress, as to become a good Defence for the Fruit, but these Covers should not be too suddenly taken away, but by Degrees the Trees should be inured to the open Air, otherwise the Change will be too great, and may occasion most of the Fruit to fall off, especially if cold Nights should follow.

By this Method Gentlemen may be supplied with most of the best Kinds of Fruit, in the Northern Parts of *England*, where, without some such Care, they cannot expect much good Fruit in their Gardens. And as Coal is in great Plenty in those Places, the Expence will be very little, therefore I am surprised that most of the Gentlemen, who live in the North, do not put this Method in Practice. That there are some few of these

Walls built in the North is well known, but then they are chiefly designed to produce a little early Fruit, more for Curiosity than any real Use; and these Walls are, for the most part, so ill contrived, that four Times the Fuel is expended, as will be requisite when the Walls are built after the Manner here directed; and where the Heat is not pretty equally distributed through every Part of the Wall, some of the Trees will have too much Heat, while others will, have little Benefit from the Fires.

There are some Persons who build their hot Walls in such a Manner, as to have the greatest Heat under the Border, near the Roots of their Trees, supposing there is a Necessity for Heat to the Roots, as well as the Branches; but this is a great Mistake, for the Fires must greatly injure the Roots of the Trees, by drying up the Moisture of the Earth, as also in scorching the tender Fibres of those Roots which lie near them; therefore this Practice should not be continued, for it is much the better Method to elevate the first Flue nine Inches or a Foot above the Level of the Border, according as the Ground is dry or wet, than to place it the least below Ground, which will only dry the Earth, and not warm the Air about the Trees, which is the only Use of artificial Heat, for it is very commonly practised to draw a Branch of a Vine, or other Fruit Tree, into a Stove, which Branch will produce its Fruit as early as if the whole Tree had been forced; when, at the same Time, all the other Branches of the same Tree, which are exposed to the open Air, will not be the least forwarded, though they are all nourished by the same Root, which is a plain Proof, that there is no Necessity for adding any Warmth to the Roots of Fruit Trees, to have their Fruit earlier or better ripened.

I have also heard of some Walls which have been built for forcing Fruit, with one continued Chasm from their Bottoms to the Top, so that they have been like double Walls, with Places at proper Distances to make the Fires, but these can be of little Use; for if the Veins are open at their Tops to let out the smoke, the Heat will also escape with it, because, if the Smoke be not led about three or four Times in Flues, in order to warm the Bricks, the Heat will pass off at the Top, without doing much Service to the Trees.

Where the Walls are planted with the best Kinds of Fruit, which are designed to ripen them in Perfection, if the Autumns should prove cold, or very wet, before the Fruit are ripe, it will be proper to put the Covers over the Trees; and if there are some slow Fires made to dry off the Damps, it will be of great Use to prevent the Fruit from growing mouldy, and to hasten their ripening; but when this is practised, the Covers should be taken off whenever the Weather will admit of it, that the Fruit may enjoy the Benefit of the free Air, without which they will be insipid or ill-tasted.

Although in the former Directions for forcing Trees, in order to have early Fruit, I have advised, that such Trees should have one or two Years Rest, in order to recover Vigour, yet that is not to be understood of these Trees, which are only designed to be brought forward enough to produce their Fruit in Perfection; for as the Fires are not designed to be made till the Beginning of *March*, the Trees will not be weakened thereby, because

cause they will be inured to the open Air long before their Fruit is ripe, and will have Time to ripen their Shoots, and form their Buds, for the next Year's Bearing; therefore these Trees may be thus forced every Year, without doing them much Injury, provided they are carefully managed.

In forcing Fruit Trees People generally hang up Thermometers under their Glasses, for the better adjusting the Heat, and regulating the Fires; but when this is practised, they should be hung where the Sun can never shine on them, for one Hour's Sun-shine upon the Ball or Tube of the Thermometer, in the Spring of the Year, will so much rarefy the Spirits, that they will rise to the Top of the Tube, when, at the same Time, the circumambient Air may not be much more than of a temperate Heat; but as the principal Use of these Thermometers is to regulate the Fires, they are seldom of much Use in the Day Time; because, if there be only one Hour's Sun-shine in the Day on the Glasses, it will warm the Air sufficiently for the Production of European Fruits, without any additional Heat, wherefore there will rarely be any Occasion for continuing the Fires in the Day, unless the Weather should prove very bad. And if, by the Fires in the Night, the Air is warmed to the temperate Point marked on the Botanick Thermometers, the Fruit will thrive much better than in a greater Heat.

There are some Persons near London who make it their Business to raise early Fruit to supply the Markets, which they perform by the Heat of Dung only, having no Fire Walls in their Gardens. The Method which these People follow is to have a good Quantity of new Dung laid in a Heap to warm (after the same Manner as is practised for making hot Beds). When this Dung is in a proper Temperature of Heat, they lay it close on the Backside of their Fruit Wall, about four Feet thick at the Bottom, and sloping to about ten Inches or a Foot thick at the Top. This Dung should be gently beat down with a Fork to prevent the Heat going off too soon, but it should not be trodden down too hard, lest that should prevent its Heating. The Outside of the Dung should be laid as smooth as possible, that the Wet may run off more easily; and if there is a Covering of Thatch, as is sometimes practised, it preserves the Dung from rotting too soon, whereby the Heat is continued the longer. The Time for laying this Dung to the Back of the Wall is the same as for making the Fires, i. e. about the Middle or End of February. The first Parcel of Dung will continue warm about a Month or five Weeks, when there should be a Supply of new Dung prepared, and the old taken quite away, or mixed up with this new Dung, to renew the Heat, which, if it works kindly, will be sufficient to last the Season. These Walls are covered with Glasses, or oiled Paper, in the same Manner as the Fire Walls, and the Trees must be treated the same Way, but there must be more Care taken to open the Glasses against these Walls, whenever the Weather will permit, otherwise the Steams of the Dung will occasion a great Dampness through the wall, which, if pent in about the Trees, will be very pernicious to them, especially at the Time they are in flower.

By this Method some Gardeners have forced long

Walls filled with old well-grown Fruit Trees, which have produced great Quantities of Fruit annually, which has well answered their Expence; but as, in many Parts of England, it will be very difficult to procure a sufficient Quantity of new Dung for this Purpose, the Fire Walls are most useful, and least expensive.

I have seen in some Places long Timber Fences erected to force Fruit Trees, by laying new Dung against the Backside, in the same Manner as is practised for the Walls, but these are by no Means proper, because the Steam of the Dung will easily get through every little Crack or Joint of the Boards, to the great Prejudice of the Trees; besides, these Boards will continue very damp, as long as any Moisture remains in the Dung, which will also be very injurious to them; and as these Boards will in a few Years decay, these will be more expensive than Walls, if they are kept in Repair for some Years, and will never answer the Design so well.

WALL FLOWER. See Cheiranthus.

WALNUT. See Juglans.

WALTHERIA. Lin. Gen. Plant. 741.

The Characters are,

The Flower has a Cup-shaped permanent Empalement of 1 Leaf cut into 5 Points at the Rim; it has 5 Heart-shaped Petals which spread, and 5 Stamina, joined in a Cylinder, terminated by loose Summits, and an oval Germen, supporting a single Style, crowned by a bifid Stigma. The Germen turns to an oval Capsule with 1 Cell inclosing 1 obtuse Seed.

The Species, are;

1. WALTHERIA foliis planis serrato-dentatis, Lin. Sp. Pl. 673. Waltheria with plain Leaves which are Saw-indented. *Alibea Americana pumila, flore luteo spicato*, Brey. Cent. 1. f. 57. Low American Marsh Mallow with a yellow spiked Flower.

2. WALTHERIA foliis oblongo-ovatis serratis, floribus confertis, pedunculis longissimis axillaribus. Waltheria with oblong, oval, sawed Leaves, and Flowers growing in Clusters, on very long Foot Stalks, at the Wings of the Branches. *Malvinda ulmifolia, flosculis pusillis muscosis constipatis*, Burm. Zeyl. 149. Tab. 68. Indian Mal-low with an Elm Leaf, and diminutive mossy Flowers growing in Clusters.

3. WALTHERIA foliis ovatis serratis nervosis, floribus confertis alaribus sessilibus. Waltheria with oval, sawed, veined Leaves, and clustered Flowers sitting close at the Wings of the Stalk.

This Genus of Plants is described in the French Memoirs of the Academy of Sciences by Mons. D'Isnard, who has given it the Title of *Monospermalthaea*, from the Habit of the Plant being like *Alibea*; and, having a single Seed to each Flower, he compounded this Name, but Dr. Linnæus has altered it to this of *Waltheria*, in Honour of Augustus Frederick Walther, Professor at Leipzig, who is a curious Botanist.

The 1st Sort grows naturally in the Brasils, and also in many Parts of the Islands in the West-Indies; it has a soft ligneous Stalk, which rises about 2 Feet high, sending out 2 or 3 Side Branches. The Leaves are oblong, oval, plain, and sawed on their Edges, of a pale yellowish green Colour, soft and hairy, and are placed alternately. The Flowers are collected in a close thick Spike at the Top of the Stalk, having soft hairy Empale-

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Empalements; they are composed of 5 Petals, connected at their Base, which are small, of a bright yellow Colour, and spread open; these are each succeeded by angular Seeds which ripen in the Empalement. It flowers in *July* and *August*, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in both *Indies*; this rises with a shrubby branching Stalk, to the Height of 8 or 10 Feet, covered with soft Hairs. The Leaves are placed alternately on long Foot Stalks; they are 4 Inches long, and 2 broad in the Middle, and are rounded at both Ends, of a yellowish green Colour, very hairy, and soft, having several longitudinal Veins. From the Wings of the Branches arise the Foot Stalks of the Flowers, which are 3 or 4 Inches long, terminated by Clusters of very small yellow Flowers, which just peep out of their hairy soft Empalements; under each Cluster is placed a small Leaf of the same Shape with those below. The Flowers are succeeded by a single Seed wrapped in the Empalement of the Flower. It flowers most of the Summer Months, and the Seeds ripen in Succession.

The 3d Sort grows naturally at *Campeschy*, from whence the Seeds were sent me. The Stalks of this are ligneous; they rise 6 or 7 Feet high, dividing into several Branches, which are less hairy than those of the former Sort. The Leaves are oval, about 3 Inches and a Half long, and two and a Half broad; they are of a yellowish green Colour, sawed on their Edges, and hairy, but are not so soft as those of the former, having many Veins running from the Mid-rib, and stand on long Foot Stalks. The Flowers are very small, yellow, and are collected into round Clusters, standing on very short Foot Stalks, close to the Wings of the Leaves; these appear in *June*, *July*, and *August*, and the Seeds ripen in Autumn.

These Plants are propagated by Seeds, which must be sown on a hot Bed, and when the Plants are fit to transplant, they must be each planted into a separate small Pot, and plunged into a fresh hot Bed, and afterward treated as other tender Plants of the same Country, for they must be kept in the Bark Stove, otherwise they will not thrive in *England*. The second Year the Plants will flower, and produce good Seeds, but they may be continued 3 or 4 Years, if the Plants are often shifted, and their Roots pared, to keep them within Compass; for if they are permitted to remain long undisturbed in the Tan Bed, their Roots will run out through the Holes in the Bottom of the Pots, and extend to a great Distance in the Tan; and when this happens, if their Roots are torn, or cut off, the Plants seldom survive it. When the Plants root into the Tan, they grow very luxuriant, and cannot be kept within reasonable Compass; but on their Roots being disturbed, their Branches will hang, and their Leaves shrivel up, and drop off, therefore, to keep these Plants within Bounds, they should be drawn up out of the Tan, at least once in 6 Weeks, during the summer Season, and the Plants shifted out of the Pots once in 2 Months; with this Management the two last Sorts may be continued several Years, but the first seldom lives longer than two Years.

WATER is one of the most considerable Requisites

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belonging to a Garden: If a Garden be without it, it brings a certain Mortality upon whatsoever is planted. By Waterings the great Droughts in Summer are allayed, which would infallibly burn up most Plants, had we not the Help of Water to qualify the excessive Heats; besides, as to noble Seats, the Beauty that Water will add, in making *Jets d'Eau*, and Cascades, which are some of the noblest Ornaments of a Garden.

In the Kitchen Garden, Water is absolutely necessary; for without it, there can be little expected; therefore in such Places where there cannot be a supply of Water obtained for Basons or Ponds, Wells must be dug; and where the Depth to the Water is too great to be raised by Pumps, there must be either Machines for raising it contrived, or it must be drawn by Hand; but in such Places which are so unhappily situated, as to require Machines for the raising of Water from a great Depth, there is but small Encouragement to make Kitchen Gardens; for then constant supplying of Water in those dry Situations will be attended with great Expence; and generally the Produce of such Land is of little Worth, especially in dry Seasons.

Where Kitchen Gardens are supplied with Water from Wells, there should be a Contrivance of large Cisterns; into which the Water should be raised, to be exposed to the Sun and Air some Time before it is used; for the Rarrefaction of this Water, when fresh drawn from Wells, is not agreeable to the Growth of Vegetables; so that where large Ponds are in the Neighbourhood of these Gardens, from whence the Water can be led into them, that is by much the best for the Growth of Vegetables; next to this, River Water is to be preferred, especially from those Rivers, which run through or near large Towns, where the Water is fattened by the Soil thrown into the Rivers; but the Water of some very clear Rivers is as hard as that from the deepest Springs, rising through Gravel or Sand; but the Springs issuing through Chalk are generally much softer.

If good Water can be obtained in Plenty, from the Neighbourhood of the Kitchen Garden, then there should be two or three Basons made in different Parts of the Garden; so that no Part of the Garden should be too far distant from the Water; for where the Water is to be carried to a considerable Distance, the Expence of Labour will be great, and there will be great Danger of the Plants suffering, from their being but sparingly watered; Labourers being very apt to slight their Work, when attended with Trouble if they are not well looked after. The Size of these Basons should be in Proportion to the Quantity of Water which will be required, or that they can be supplied with; but their Depth should not be more than 4 Feet; for when they are deeper, there is Danger of Persons being drowned, if by Accident they should fall into them; besides Water, when very deep, is not so well warmed and tempered by the Sun and Air, as when it is shallow; therefore the Water of shallow Basons is best for the Use of Gardens.

In making these Basons, there must be particular Regard had to the natural Soil of the Garden; for in loose sandy Lands there will require much Care in making the Clay Walls so as to hold Water; but where the Ground is loamy, or inclining to Clay, there

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there will be little Difficulty in making Basons; and the Clay Walls need not be so thick. Where the Ground is loose, the Clay Walls at the Bottom should not be less than 2 Feet thick, and those on the Sides one Foot and a Half. The Clay should be well wrought over and trod after it is taken from the Pit, before it is used in building the Wall. The true Sign of good Clay is, that it be close and firm, without any Mixture of Sand; and that it be tenacious and fat in handling; as for the Colour, it is no Matter whether it be green, yellow, blue, or red; but before the Clay is brought to the Place, the Bason should be dug out and formed; for if the Clay is too long exposed to the Sun and Air, it will not be so fit for Use, especially if it be laid in small Parcels.

The best Time of the Year for making Basons is in Autumn when the Sun is declining, and the Weather temperate; for in the Spring of the Year the East and North-east Winds generally blow, which are drying; so that the Clay Walls, which are not very carefully covered as fast as they are made, very often crack in many Places; and these small Cracks often grow wider, and the Water will find a Passage through them. The same Inconveniency happens from the violent Heat of the Sun in Summer; for when the Clay dries fast, it will be very difficult (not to say impossible) to prevent its cracking, and these will let off the Water; and if the Clay Wall should not be well made at first, it will be very difficult to mend it after; besides the Uncertainty there is in finding out the Places through which the Water finds a Passage, which is seldom done without strictly examining every Part of the Clay.

When the Ground is dug out level, where the Bason is designed, the Clay must be brought in, and laid very carefully in the Bottom, being very careful that no Dirt, or small Stones, be mixed with the Clay, and there must be some Water thrown from Time to Time upon it, as it is closely trod by Mens naked Feet, and then it must be rammed very close: In performing this, there must be great Care taken that every Part of the Clay is equally kneaded and rammed, without which there will be great Danger of the Water making its Way through those Parts of the Clay which are not well wrought. After the Bottom is finished with Clay, there should be a *Stratum* of coarse Gravel laid over it about 4 or 5 Inches thick, which will greatly secure the Clay Wall, and render the Water clear; but where the Basons are large, so that the Clay Walls are long in making, the Clay should be covered with moist Litter, to prevent its drying, which may be taken off when the Whole is finished, to lay on the Gravel; but if Part of the Side Walls are finished before this is done, it will be the better, because there may be some Water let into the Bason as soon as the Gravel is laid, which will prevent the Clay from cracking; then the Walls round the Side of the Bason must be carried up with the same Care as hath been directed for the Bottom, observing also to cover the Clay first with Litter while the Work is carrying on, and afterward lay it with coarse Gravel; and as the Walls are finished round, the Water may be let in, to secure the Clay from drying or cracking.

When the Whole is finished, the upper Part of the

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Walls must be laid with Turf, which will secure them from being broken, and prevent the Sun from penetrating the Clay; but before this is done, there must be a *Stratum* of Sand laid upon the Clay, 4 or 5 Inches thick, and upon this a thin *Stratum* of good Earth laid, for the Grass to take Root in. The Bed of Sand will prevent the Grass from rooting into the Clay, and this will also keep out the Frost, which will penetrate the Clay, where there is not a Covering of Sand to secure it, and by being frozen and swelled, and afterward drying, the Clay is very apt to crack in many Places. The Turf on the Side of the Bason should be laid as far down as the Water is apt to shrink, that no Part of the Clay may be wholly exposed to the Weather, for the Reasons before given.

Where these Basons are made, there should be no Trees growing near, for the Roots of Trees or Shrubs will extend themselves to the Clay Walls, and by penetrating them, will occasion Fissures, through which the Water will find an easy Passage; and where tall Trees are growing near Basons or Ponds, the shaking of the Trees with violent Winds is apt to loosen the Clay Walls, and occasion Cracks in them, therefore these Cautions are necessary to be observed.

In some Countries, where Clay cannot be easily procured, the Walls of these Basons are frequently made of Chalk, which is beaten into fine Powder, and made into a Sort of Mortar, and with this the Walls are made, by ramming and working it very hard and firm. These Basons hold Water very well where they can be well supplied with Water, so as not to be too long dry, for when it so happens, the Sun and Wind dry the Chalk, and cause it to crack, and these Cracks commonly extend through the Thickness of the Walls, so as to let off the Water.

There are others who build their Walls with Brick laid in Terrass, which is a good Method for such Places where the Ground is very loose and sandy, because the Walls, when well built, will support the loose Earth from falling or settling away from the Sides; but where Terrass is used, the Walls should not be long dry and exposed, for the Heat is apt to crack the Terrass.

Some Persons make a Cement of powdered Tile and Lime, two Thirds of the former to one Third of the latter, being very careful in mixing it not to add too much Water, but to labour it well in the beating, which is a principal Thing to be observed. With this Cement they cover the Surface of the Walls of Basons, about 2 Inches thick, laying the Plaster very smooth, and being very careful that no Sticks, Straws, or Stones, are mixed with it; this Plastering is commonly performed in dry Weather, and as soon as it is finished, it is rubbed over with Oil or Bullocks Blood, and the Water let into the Bason as soon as possible. This Cement has the Property of hardening under Water, so as to be equal to Stone, and will continue as long sound.

Whatever the Materials are with which the Walls are made, there must be great Care taken, that they are built so strong, as that they may resist the Weight of the Water; so that where the Ground about the Bason is not very solid, the Walls should be thicker, and

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and supported on the Backside by Buttresses of the same Materials, placed at proper Distances; or if the Walls are made of Clay, there should be Planks supported by strong Timbers placed at proper Distances to support the Clay, otherwise there will be great Danger of their being broken down, especially where the Basons are large, so that the Winds have Room to act upon the Surface of the Water, and drive it in large Waves against the Banks.

The Directions here given are only for Basons or Reservoirs of Water for Use, so must not be supposed for large Pieces of Water for Beauty; for where the Ground is of a loose sandy Nature, so as not to hold Water, the Expence of claying the Bottom and Sides will be too great, if the Water is of a large Extent, therefore it would be imprudent to attempt it in such Places, but where there is a Supply of Water, and the Ground is well adapted to hold it. There can be no greater Beauty than that which Water affords to a Seat, provided it is properly disposed, therefore I shall give some general Hints, by which Persons may be directed in the forming of large Pieces of Water, so as to render them beautiful.

In those Places where there is a Command of running Water, it will be a great additional Beauty, because the Water will always be much clearer, so more beautiful, than still Water; besides, if it moves with any Degree of Velocity, there may be one or more Falls of Water contrived, which will still add to the Beauty. In conducting this Water, the Level of the Ground must be carefully taken, for the great Skill in contriving Rivers, or other Pieces of Water, is in the saving Expence in the digging, therefore where Ground is naturally low, the Water should be conducted through these low Parts, and never endeavour to carry it through higher Ground, for in such Places the Banks will be so high, as to shut out the Sight of the Water, to Persons who stand at a little Distance from it on either Side, unless the Water is very broad; and where it is so, the Eye is thrown to a considerable Distance over the Surface of the Water, by the Steepness of the Banks, therefore the Slopes on the Side of the Water should always be made as easy as possible; nor should they be made flat, with sharp Edges on the Top (as is too generally practised); for these stiff regular Slopes are not near so pleasing, as those which are made gently convex, for the Eye will slide over these to the Water, having no Ridge to cut the Sight, and at a small Distance, there will be no Appearance of a Cut, as will always be seen, where the upper Part of the Slope is finished in a sharp Angle; and the great Skill is to contrive, that as much of the Surface of the Water may appear to the Sight as possible.

In most of the old Gardens, where there are Pieces of Water, there is nothing more common than to see them brought into regular Figures, such as long strait Canals, or Basons, either round or polygonal, so that all the Boundaries of the Water are seen at one View, but these, however large may be their Extent, are not near so pleasing as where the Water is so conducted, as that the Termination may be seen as little as possible; for when the Water is lost from the Sight, by some gen-

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tle easy Turns, the Imagination may be led to suppose the Surface of the Water extended to a considerable Distance; so that sometimes small Pieces of Water are so artfully contrived, as to make them appear very considerable.

As in the old Stile of laying out Gardens the Water was generally wrought into regular strait Canals, which corresponded with the strait Walks, Hedges, and regular Lines of Trees, which were then chiefly studied; so, as the Taste altered from this stiff Method of disposing Gardens, to that which approached nearer to Nature in the forming of Rivers, or other large Pieces of Water, those who have succeeded best have always had great Regard to the natural Situation of the Ground, so as to lead the Water through the natural Hollows of the Ground, whereby the great Expence of digging is saved, and by contriving to make the Head in some narrow Part of the Ground, it may be done at a much less Expence, and will be better secured, than where the Head is of great Extent; therefore it is better either to shorten the Extent of the Water, or to carry it farther, according to the natural Situation of the Ground, than to terminate it where it may occasion great Expence; and it is always observed, that where there is the greatest Expence in the making of these large Heads, the Whole will appear less beautiful than where Nature is chiefly consulted, for nothing can be more unsightly, than those extensive Heads which are sometimes made to Pieces of Water, which rise six or eight Feet, and sometimes much more, above the Surface of the Ground, whereby the Water is hid from the Sight, to those Persons who are situated on that Side of the Head, and a large Bank of Earth shuts up the View; and sometimes these Heads are so situated, as to appear in Sight of the House, or from a principal Part of the Gardens, which is a very great Absurdity.

Since the Taste has been altered in the Disposition of Gardens, and that a more natural Method has been pursued by Persons of Judgment, there have been great Improvements made in the Distribution of Waters, so as to render it truly ornamental to the Seats where they are placed, but there are some, who, by pretending to imitate or copy from these Works, have erred as much in making so many short unnatural Turns in their Water, as those before mentioned have done by their regular strait Sides; for in what is usually termed Serpentine Rivers, nothing is more common than to see a small Surface of Water twisted in so many short Turns, that many of them appear at one View; and these Windings are often made like Parts of Circles, with such an Air of Stiffness, as to render them equally disagreeable with any the most studied Figures, to Persons of good Taste. Another Thing is also common to these unnatural Pieces of Water, which is, their being made of the same Width in every Part, which should always be avoided, for nothing is more beautiful, than to see the Water extend to a large Surface in some Places, and to have it in others more contracted; and this may be generally done at a much less Expence than the other, where the natural Site of the Ground is well considered, which should be done with the utmost Care, before any Work of this Sort is begun, for Want

of which many Persons have repented after having been at great Expence.

There is also another material Thing to be observed, in the Situation of large Pieces of Water, which is, never to extend them so near to the House, as that they may annoy it, by the Damp, which the Vapours exhaling from the Water may occasion, especially when exposed to the Wind, which will drive the Vapours toward the House, and thereby render the Habitation unhealthy, and destroy the Furniture, therefore it is much better to walk out to see the Water, than to sacrifice the Habitation for the Pleasure of seeing the Water from the House; nor should the Water be so situated, that the Surface may be level with the Floor of the House, for there is generally some Moisture, which will percolate through the Veins of the Earth, enough to occasion so much Damp, as to render the lower Part of the House unwholesome; and where there is a considerable Damp in the Foundation of a House, Part of it will ascend upward, and render the Apartments so, therefore great Care should be had as to this.

Where Persons are not so happily situated, as to have the Command of a constant running Water, but yet from some neighbouring Reservoirs or Ponds can be supplied with it; there may be some agreeable Pieces of Water contrived, both for Use and Beauty, especially where there is a large Supply; for otherwise it will be better to contract the Design; for nothing can be more ridiculous than that of having either Ponds or Rivers designed, where they cannot be supplied with Water in the dry Seasons, when there is the greatest Want of it, both for Use and Pleasure.

In those Places where there is a great Scarcity of Water, there should be large Reservoirs contrived, into which the Water which descends from the Hills and rising Grounds may be led; so that a large Body of Water may be collected during the rainy Season, for a Supply in Time of Drought; these Reservoirs, when large, may contain as much Water as may be necessary for the Use of the House and Gardens; but these can rarely supply Water enough for Beauty; therefore in such Situations it should not be attempted.

As Water never appears so well, as when it is situated near Woods, so in the Contrivance of Rivers, or Pieces of Water, they should be so placed as to have Planting near, that the Contrast between the Wood and Water may appear as perfect as possible; and in some Places where the Water can be seen through the open Groves, between the Stems of large Trees, it will add greatly to the Beauty of the Place; but where the Water is designed to terminate, the Head should be as much concealed as possible, by close Plantations of evergreen Trees, which may be faced with Alders and Weeping Willows, planted close on the Sides of the Water, so that their Branches may hang over; and if the Water is contracted, and led through these Trees with a gentle Winding, it may seem to run much farther, and to communicate with a larger Body of Water at a Distance; in contriving which, the greatest Art is to make it appear as natural as possible; for the less Art there appears in these Things, the longer they will please,

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and the more they will be esteemed by Persons of good Judgment.

WATSONIA.

The Title of this Genus is given to it in Honour of my learned Friend Dr. William Watson, F. R. S. whose Knowledge in the Science of Botany justly demands this Tribute.

The Characters are,

The Flower has a permanent Spatha (or Sheath) which divides into 2 Parts almost to the Bottom; it is of 1 Petal. The Tube is long, a little curved, and swells at the upper Part; the Rim is cut into 6 obtuse Segments which spread open. It has 3 long slender Stamina terminated by prostrate oblong Summits, and a roundish three-cornered Germen, supporting a slender Style a little longer than the Stamina, crowned by 3 bifid Stigmas. The Germen afterward turns to a roundish three-cornered Capsule, having 3 Cells, opening with 3 Valves, each containing 3 or 4 roundish Seeds.

This Genus belongs to the first Section of Linnaeus's third Class, the Flower having three male and one female Part. It differs from the *Gladiolus*, in having a tubulous Flower of one Petal, and from *Crinum*, in having but three Stamina.

We know but one Species of this Genus, therefore it wants no distinguishing Epithets.

WATSONIA. This has been titled by Dr. Trew, *Meriana flore rubello*, before he had been acquainted with the Name which I had applied to it, but he has since informed me by a Letter, that as I had raised the Plant from Seeds, he would suppress his Title, and adopt mine, who he thought had the most Right to give it, and that he rather chooses to do so, because the Figure he has published of it was drawn from the Plant in the Chelsea Garden.

The Root is bulbous, compressed, and shaped like a Kidney, and is covered with a fibrous brown Skin. The Leaves are Sword-shaped, about a Foot long, and an Inch broad, ending in Points; the two Sides have sharp Edges, but the Middle is thicker, and has a prominent Mid-rib; they are of a dark green Colour, and rise immediately from the Root. The Stalk comes out from the Root between the Leaves, and rises a Foot and a Half high, toward the upper Part. The Flowers are produced from the Side, standing alternately at about an Inch and a Half Distance from each other; they have each a Spatha or Sheath, composed of 2 Leaves joined at their Base, where they are broad, but gradually lessen to their Points. Before the Flowers appear, they are of the same green Colour with the Stalk, and are divided but a small Part of their Length, inclosing the Flower, but afterward they are split almost to the Bottom, and wither before the Flowers decay, becoming dry, and wrap round the Seed Vessel. The Tube of the Flower is an Inch and a Half long, narrow at the Base, and a little curved, swelling much larger the upper Half. The Rim is divided into 6 obtuse Segments which spread open; the Flower is of a Copper red Colour on the Outside, but of a deeper red within; it has 3 Stamina, little longer than the Petal, which are incurved, and are terminated by oblong Summits of a dark brown Colour, and are fastened in the Middle to the Apex of the Stamina,

lying prostrate. At the Bottom of the Tube of the Petal is situated an oval three-cornered Germen, supporting a slender Style a little longer than the Stamina, crowned by 3 bifid reflexed Stigmas. The Flowers generally appear in *April* or *May*, and the Seeds ripen in *July*.

It is a Native of *Ethiopia*. The Seeds of this, and also some of the Sorts of *Ixia*, were sent me by my Friend Dr. *Job Baster*, F. R. S. of *Zirkzee*, which succeeded in the *Chelsea* Garden, where many of them have since produced their beautiful Flowers.

This Plant is propagated by Offsets from the Root, as the *Crocus* or *Gladiolus*, which are produced in pretty great Plenty; the Time for transplanting the Roots is in *August*, soon after the Stalks decay; the larger Roots must be each put into a separate Pot filled with light fresh Earth, and may be placed in the open Air till toward the End of *September*, when the Leaves will begin to appear above Ground; at which Time it will be proper to remove them into Shelter; for as this Plant is a Native of a warm Country, it will require some Shelter from the Frost; at least hitherto it has been so managed; for until the Roots are become more common, it would be imprudent to venture them abroad in Winter; though they may probably be hardy enough to resist the Cold of our ordinary Winters, when planted in a warm Border, and a dry Soil, at least with a little Shelter in hard Frosts; for those Plants which have been placed in an open airy Glass Case, have succeeded better than those which have been in the Stove; and the Flowers have been much stronger, and of longer Duration; though those in the Stove have flowered a Month earlier; but these have been so much drawn, as not to produce Seeds; whereas those which have been treated pretty hardily, and had Plenty of Air, have seldom failed.

The best Way of treating these Roots, is to plunge the Pots into an old Bed of Tanners Bark, which has lost its Heat, some Time in *October*; this Bed should be covered with a Frame, the Glasses of which should be drawn off every Day in mild Weather, that they may enjoy as much free Air as possible, to prevent their drawing up weak; but they must be covered in bad Weather, and screened from Frost. The latter End of *March*, when they begin to put out their Flower Stalks, the Pots should be removed to an airy Glass Case, where they may stand to flower, and when the Flowers are decayed, they should be placed in the open Air, to perfect their Seeds.

The Offsets and small Roots may be planted three or four in a Pot, according to their Size, and should have the same Treatment as the larger Roots the first Year, and by that Time twelvemonth, they will be strong enough to flower, so should have separate Pots.

WILDERNESSES, if rightly situated, artfully contrived, and judiciously planted, are very great Ornaments to a fine Garden; but it is rare to see these so well executed in Gardens as could be wished, nor are they often judiciously situated; for they are frequently so situated as to hinder a distant Prospect, or else are not judiciously planted; the latter of which is scarce ever to be found in any of our most magnificent Gardens, very few of their Designers ever studying the natural Growth of Trees so as to place them in such Manner, that they may not obstruct the Sight from

the several Parts of the Plantation which are presented to the View; I shall therefore briefly set down what has occurred to me from Time to Time, when I have considered these Parts of Gardens; whereby a Person will be capable to form an Idea of the true Beauties which ought always to be studied in the Contrivance of Wilderesses.

1. Wilderesses should always be proportioned to the Extent of the Gardens in which they are made, that they may correspond in Magnitude with the other Parts of the Garden; for it is very ridiculous to see a large Wilderness planted with tall Trees in a small Spot of Ground; and, on the other hand, nothing can be more absurd, than to see little paltry Squares, or Quarters of Wilderness Work, in a magnificent large Garden.

2. As to the Situation of Wilderesses, they should never be placed too near the Habitation, because the great Quantity of Moisture which is perspired from the Trees will cause a damp unwholesome Air about the House, which is often of ill Consequence. Nor should they be situated so as to obstruct any distant Prospect of the Country, which should always be preserved where-ever it can be obtained, there being nothing so agreeable to the Mind as an unconfined Prospect of the adjacent Country; but where the Sight is confined within the Limits of the Garden from its Situation, then there is nothing so agreeable to terminate the Prospect, as a beautiful Scene of the various Kinds of Trees judiciously planted; and if it is so contrived, that the Termination is planted circularly, with the Concave toward the Sight, it will have a much better Effect, than if it end in straight Lines or Angles, which are never so agreeable to the Mind.

3. The Trees should always be adapted to the Size of the Plantation, for it is very absurd to see tall Trees planted in small Squares of a little Garden; and so likewise, if in large Designs are planted nothing but small Shrubs, it will have a mean Appearance. It should also be observed, never to plant Ever-greens amongst deciduous Trees, but always place the Ever-greens in a Wilderness, or a separate Part of the Wilderness by themselves, and that chiefly in Sight, because these afford a continual Pleasure both in Summer and Winter; when in the latter Season the deciduous Trees do not appear so agreeable; therefore, if the Borders of Wilderness Quarters are skirted with Ever-greens, they will have a good Effect.

4. The Walks must also be proportioned to the Size of the Ground, and not make large Walks in a small Wilderness (nor too many Walks, though smaller), whereby the greatest Part of the Ground is employed in Walks; nor should the grand Walks of a large Wilderness be too small, both of which are equally faulty. These Walks should not be entered immediately from those of the Pleasure Garden, but rather be led into by a small private Walk, which will render it more entertaining; or if the large Walk be turned in Form of a Serpent, so as not to shew its whole Extent, the Mind will be better pleased, than if the Whole were open to the View.

The old formal Method of contriving Wilderesses was to divide the whole Compass of Ground, either in-

into Squares, Angles, Circles, or other Figures, making the Walks correspondent to them, planting the Sides of the Walks with Hedges of Lime, Elm, Hornbeam, &c. and the Quarters within were planted with various Kinds of Trees promiscuously without Order; but this can by no means be esteemed a judicious Method, because first hereby there will be a great Expence in keeping the Hedges of a large Wilderness in good Order by shearing them, which, instead of being beautiful, are rather the Reverse; for as these Parts of a Garden should, in a great Measure, be designed from Nature, whatever has the stiff Appearance of Art, does by no means correspond therewith; besides, these Hedges are generally trained up so high, as to obstruct the Sight from the Stems of the tall Trees in the Quarters, which ought never to be done.

In the next Place the Walks are commonly made to intersect each other in Angles, which also shew too formal and trite for such Plantations, and are by no Means comparable to such Walks as have the Appearance of Meanders or Labyrinths, where the Eye cannot discover more than twenty or thirty Yards in Length, and the more these Walks are turned, the greater Pleasure they will afford. These should now and then lead into an open circular Piece of Grass; in the Center of which may be placed either an Obelisk, Statue, or Fountain; and if in the middle Part of the Wilderness there be contrived a large Opening, in the Center of which may be erected a Dome or banqueting House surrounded with a green Plat of Grass, it will be a considerable Addition to the Beauty of the Place.

From the Sides of the Walks and Openings, the Trees should rise gradually one above another to the Middle of the Quarters, where should always be planted the largest-growing Trees, so that the Heads of all the Trees will appear to View, but their Stems will be hid, which will have a vastly different Effect from the common Method, where the Trees are planted large and small without Order; so that many Times the largest are next the Sight, and small ones behind them, just according as it happens, in which Manner the small ones, being overhung and shaded, seldom thrive well.

But in order to plant a Wilderness with Judgement, the usual Growth of all the different Sorts of Trees should be well considered, that each may be placed according to the Magnitude to which they generally arrive; otherwise, if they are at first planted one above another, as before directed, they will not continue to grow in this Order many Years; for some Sorts will greatly outgrow the others, and thereby render the Plantation less beautiful; but when they are placed according to their usual Manner of growing, they will always continue nearly in the same Order, which renders them very entertaining to the Sight.

These Trees should also be allowed a proportionable Distance, according to their Growth, and not be crowded so close as is commonly practised, whereby there are four Times the Number of Trees planted which need be, and this close Planting causes them to aspire to a great Height; but then they want the noble Diffusion of Branches, which is vastly more agreeable to the Sight, than a Parcel of thin taper Stems, with scarcely any Heads, as is too often the Case in some of the lar-

gest Gardens in *England*, where, instead of looking at a noble Parabola of Trees, with their spreading globular Heads, a Parcel of naked Stems present themselves to View; and where the Trees are thus crowded, they never thrive half so well, nor will they continue half so long, as those which are allowed a proper Distance, for their Roots, running and interfering with each other, draw the Nourishment away faster than the Ground can supply them, which causes their Leaves to be small, and, in dry Seasons, to decay, and fall off, long before their usual Time, and thereby renders the Plantation less agreeable.

In the Distribution of these Plantations, in those Parts which are planted with deciduous Trees, there may be planted next the Walks and Openings, Roses, Honey-suckles, *Spiræa frutex*, and other Kinds of low-flowering Shrubs, which may be always kept very dwarf, and may be planted pretty close together; and at the Foot of them, near the Sides of the Walks, may be planted Primroses, Violets, Daffodils, and many other Sorts of Wood Flowers; not in a strait Line, but rather to appear accidental, as in a natural Wood. Behind the first Row of Shrubs should be planted Syringas, Cytisuses, *Althæa frutex*, Mezereons, and other flowering Shrubs of a middle Growth, which may be backed with Laburnums, Lilacs, *Guelder* Roses, and other flowering Shrubs of a large Growth; these may be backed with many other Sorts of Trees, rising gradually to the Middle of the Quarters, from whence they should always slope down every Way to the Walks.

By this Distribution you will have the Pleasure of the flowering Shrubs near the Sight, whereby you will be regaled with their Scent, as you pass through the Walks, which is seldom observed by those who plant Wildernesses, for nothing is more common than to see Roses, Honey-suckles, and other small flowering Shrubs, placed in the Middle of large Quarters, under the Drooping and Shade of large Trees, where they seldom thrive; and if they do, the Pleasure of them is lost, because they are secluded from the Sight. If these Quarters are slightly dug every Winter, it will keep the Ground clean from noxious Weeds, and be a great Benefit to the Trees. And the Expence of doing this, where Labour is cheap, cannot be very considerable, unless in very great Plantations.

But, beside these grand Walks and Openings (which may be laid with Turf, and kept well mowed), there should be some smaller Serpentine Walks through the Middle of the Quarters, where Persons may retire for Privacy. There need be nothing but the Ground of the Place made level, and kept hoed, to clear it from Weeds, which will be no great Trouble to do with a *Dutch* Hoe, which is broad, and will make great Ridance, and then Rake them over to make them handsome. These Walks need not be very broad, but should be turned in such a Manner, as not to deviate far from the Middle of the Quarter, because there the Trees being largest will afford the amplest Shade. Five or six Feet will be a sufficient Width for these Walks, in large Quarters, but in small ones four Feet is full enough. By the Sides of these private Walks may also be scattered some Wood Flowers and Plants, which, if attfully planted, will have a very good Effect.

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In the general Design for these Wildernesses it should not be studied to make the several Parts correspondent, for that is so formal, and stiff, as to be now quite rejected. The greater Diversity there is in the Distribution of these Parts, the more pleasure they will afford; and since, according to this Method of designing and planting, the different Plants never present themselves to the same Views, it is no Matter how different they are varied asunder; that Part of them which is most in View from the House, or other Parts of the Garden, may be planted with Ever-greens, but the other Parts may be planted with deciduous Trees in the foregoing Manner.

The Part planted with Ever-greens may be disposed in the following Manner; viz. in the first Line, next the great Walks, may be placed Laurustinus, Boxes, Spurge Laurel, Juniper, Savin, and other dwarf Ever-greens; behind these may be placed Laurels, Hollies, Arbutuses, and other Ever-greens of a larger Growth; next to these may be placed Alaternuses, Phyllireas, Yews, Cypresses, *Virginian Cedars*, and other Trees of the same Growth; behind these may be planted *Norway* and Silver Firs, the true Pine and other Sorts of the like Growth; and in the Middle should be planted *Scotch Pines*, Pinastrs, and other of the largest growing Ever-greens, which will afford a most delightful Prospect, if the different Shades of their Greens are curiously intermixed. And in order to render the Variety greater, there may be several Kinds of hardy evergreen Trees and Shrubs obtained from the North Parts of *America*, as there are already many in *England*, which are very fit for this Purpose, and are mentioned in different Parts of this Book.

This Manner of separating the Ever-greens from the deciduous Trees will not only make a much better Appearance, but also cause them to thrive far beyond what they usually do when intermixed; therefore I should never advise any Person to plant them promiscuously together.

By what I have said concerning the planting the Trees one behind another, according to their different Growths, I would not have it understood, that I mean the placing them in strait Lines, which is too stiff and formal for these Plantations; all that is intended is, to place the front Rows of Trees on each Side the Walks, at an equal Distance from the Side of the Walks, which being twisted in easy natural Turns, the Shrubs having the Curves will stand in the same Direction, and must turn in the same Manner as the Walks. Those behind may be placed after any Manner, provided Care be taken to allow each sufficient Room to grow, and that there may appear no uneven Gaps in the Distance of their Heads, but that they may all rise gradually, so as to form a handsome Slope.

In small Gardens, where there is not Room for these magnificent Wildernesses, there may be some rising Clumps of Ever-greens, so designed as to make the Ground appear much larger than it is in Reality; and if in these there are some Serpentine Walks well contrived, it will greatly improve the Places, and deceive those who are unacquainted with the Ground, as to its Size. These Clumps or little Quarters of Ever-greens should be placed just beyond the plain Opening of Grass before the House, where the Eye will be carried from the plain Surface of Grass to the regular Slope of

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Ever-greens, to the great Pleasure of the Beholder; but if there is a distant Prospect of the adjacent Country from the House, then this should not be obstructed, but rather be left open for the Prospect bounded on each Side with these Clumps, which may be extended to those Parts of the Ground, where no View is obstructed. These small Quarters should not be surrounded with Hedges, for the Reason before given, nor should they be cut into Angles, or any other studied Figures, but be designed rather in a rural Manner, which is always preferable to the other, for these Kinds of Plantations.

In Wildernesses there is but little Trouble or Expence after their first planting, which is an Addition to their Value; the only Labour required is to mow and roll the large Grass Walks, and to keep the other Ground Walks free from Weeds. And in the Quarters, if the Weeds are hoed down two or three Times in a Summer, it will add to their Neatness. The Trees should also be pruned to cut out all the dead Wood or irregular Branches, where they cross each other and just to preserve them within due Bounds: and as was before observed, if the Ground be slightly dug between the Trees, it will greatly promote their Vigour. This being the whole Labour of a Wilderness, it is no Wonder they are so generally esteemed, especially when we consider the Pleasure they afford.

SWEET WILLIAMS. See *Dianthus*.

WILLOW. See *Salix*.

WILLOW, the French. See *Epilobium*.

Of WINES, and vinous Liquors.

WINE is a brisk, agreeable, and spirituous Juice, drawn from vegetable Bodies, and fermented.

Dr. *Boerhaave* characterizes Wine, that the first Thing that it affords by Distillation, be a thin, fatty, inflammable, &c. Fluid, called a Spirit; and in this it is distinguished from another Class of fermented vegetable Juices; viz. Vinegars; which instead of such Spirit, yield for the first Thing an acid, unflammable Matter.

In order to the making Wines, it will be of great Advantage to be well acquainted with the Business of Fermentation. This Dr. *Boerhaave* defines and explains as follows:

Fermentation is a Change produced in vegetable Bodies, by means of an intestine Motion excited therein; the Effect whereof is this, that the Part which first rises from them in Distillation, is either a thin, fat, acid, hot transparent, volatile, and inflammable Fluid, that will mix with Water; or else a thin, acid, pellucid, less volatile, unflammable Liquor, capable of extinguishing Fire.

The Liquor, obtained by means of Fermentation, is called thin, because none appears to be thinner than the Spirit of fermented Vegetables; Acid, because it acts almost like Fire, when applied to the Tongue, or other Parts of the Body; Volatile, because there appears to be no Liquor, that is raised with greater Ease; but it is this Liquor being totally inflammable, and at the same Time capable of mixing with Water, that ultimately distinguishes Fermentation from all other Operations in Nature; for neither Putrefaction, Digestion;

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Effervescence, nor any Thing of that Kind, will ever afford a Liquor at once possessed of those Qualities.

Putrefaction, indeed, as well as Fermentation, is performed by means of an intestine Motion; but the former will never produce either of the Liquors above described, as the Effects of Fermentation; that is, neither a vinous nor acetous Liquor.

We see then, that there are two different Effects of Fermentation, the Production of an inflammable Spirit, and an unflammable Acid; and whatever Operation will afford neither of these Liquors, is improperly called Fermentation; which therefore can only take Place in the vegetable Kingdom; for all the Art in the World, so far as hitherto appears, will never gain such Spirits from Animals or Fossils; and consequently never excite an actual and real Fermentation in them; for Fermentation is the single Operation in Nature, by which such Spirits can be obtained.

2. Any vegetable Liquor fermented, as to afford the inflammable Spirit above-mentioned, for the first Thing in Distillation, we call Wine; but if the Liquor be so fermented, as first to afford the acid unflammable one, it is called Vinegar; by which we mean a very thin, acid, volatile, vegetable Liquor, capable of extinguishing Fire. So likewise, under the Name of Wine, we include Beer or Ale, Mead, and Metheglin, Cyder, Perry, all Sorts of artificial Wines, and whatever Liquors afford Spirits possessed of the Properties before set down.

The like is to be understood of Vinegar, which is obtainable from all the same Bodies that afford Wine; so that we have either the Wine or Vinegar of all Sorts of Fruits, as of Grapes, Currants, Mulberries, Cherries, &c. all Sorts of Grain, as Barley, Wheat, Oats, &c. all Sorts of Pulse, as Beans, Peas, Tares, &c. all Sorts of Roots, as Turneps, Carrots, Radishes, &c. and in short, of all Sorts of vegetable Substances, even Grass itself.

3. All the Bodies capable of being changed by Fermentation, either into Wine or Vinegar, are said to be fermentable Bodies; and because such a Change can only be wrought, so far as we know at present, upon Vegetables, these alone are accounted fermentable.

4. Any Matter, which, being mixed with a fermentable Body, increases its intestine Motion, or excites or forwards the Fermentation, is called the Ferment; and, according to the Doctrine before delivered, nothing can properly be called so, but what will produce either Wine or Vinegar.

These fermentable Bodies may be reduced to the following Classes.

The first Class will consist of the mealy Seeds; i. e. all the Grain, which, being fully ripe, and well dried, may be reduced, by grinding, to a light Meal or Flour, that is neither clammy nor unctuous.

The second Class consists of, all the pulpy Summer Fruits, which, when ripe, affect the Tongue with the Sense of Acidity and Sharpness, as Apples, Pears, Grapes, Gooseberries, &c. Under this Class may be ranged all manner of bulbous pulpy Roots growing in the Ground, if they are first deprived of their volatile, alkaline Salt, which is apt to determine them to Putrefaction.

The third Class takes in all the juicy Parts of Plants,

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as the Leaves, Flowers, Stalks, and Roots, provided they are not too oily, or too alkaline; in which Cases Vegetables will rather putrefy than ferment.

The fourth Class contains the fresh, expressed, and native Juices of all Kinds of Vegetables; to which may be added, all the native, saline Liquors that distil from wounded Plants, as the Tears of the Vine, the Walnut, the Birch Tree, &c.

Under the fifth Class come the most perfect of all the vegetable Juices; viz. those that are unctuous, condensed, and elaborated by Nature herself, such as Honey, Manna, Sugar, and all other Kinds of concocted Juices capable of dissolving in water.

In order to fit any of the fermentable Bodies for Fermentation, there are several Particulars requisite:

1. Maturity; the Juice of unripe Berries, as of Currants or Gooseberries, for instance, will scarce be brought to ferment at all; while it is very difficult to hinder their Juice, when fully ripe, from falling spontaneously into Fermentation.

Thus the Juice of unripe Grapes, being incapable of fermenting, is a rough, acid Liquor, called Verjuice, that will for several Years remain in the same unactive State; but after they are come to Maturity, it can no sooner be pressed into the Vessel, than it becomes a fermentable spirituous Fluid.

2. Another Requisite to prepare a Body for Fermentation is, that it should contain only a moderate Proportion of Oil; for if it either exceeds in the Quantity, or be entirely destitute of Oil, it will never be brought to ferment at all. Thus Almonds, Fennel Seeds, &c. are always deprived of their Oil before they are attempted to be fermented.

3. The Bodies intended for Fermentation must not be too acid or austere; as is plain from the acid Juices of unripe Fruit, which are greatly indisposed to ferment.

4. The last thing required to fit and prepare a Body to undergo Fermentation, is the property of dissolving in Water; for want of which, all acid Bodies, and such Woods, Roots, and Herbs, as are dry and hard, become unfit for this Operation; for unless the Parts of these Bodies are dissolved, the requisite intestine Motion thereof will not ensue; but without such Motion, Fermentation cannot subsist.

Hence Honey itself can never be made to ferment, whilst it retains its native, thick Consistence; but, being dissolved by Heat, or let down with Water, it immediately enters the State of Fermentation. On the other hand, so violently as the Juice of Grapes affect this State, yet if, immediately after it is expressed, it be reduced, by boiling, to the Consistence of a Jelly, it will lie quiet, and never ferment at all, unless it be again diluted, and let down with Water.

Ferments are of two Kinds; the natural or spontaneous, and those produced by Fermentation.

The spontaneous, or natural Ferments, are,

1. All the fresh expressed Juices of fully ripened Plants, which easily run into Fermentation.

2. Honey, Manna, Sugar, and the like thick and inspissated vegetable Juices, which cause a strong Fermentation.

3. The Ferments produce by Fermentation are, the fresh Flowers or Yeast of any fermenting vegetable Juice

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or Liquor, as of Wine, Beer, &c. By Flowers or Yeast is to be understood that light frothy Matter, which covers the Surface of the fermenting Liquor in the Nature of a tender Crust; and which, being added to any other fermentable Juices, will excite a Fermentation in them.

4. The fresh *Faces* or Lees of any fermenting Liquor, as of Wine, Ale, Beer, &c. For all Fermentation divides the Liquor, which is the Subject of it, into three Parts; viz, the Flowers or Yeast, which possess the uppermost Place; the operating or fermenting Fluid, which lies in the Middle; and the gross and seemingly exhausted Matter, which, falling to the Bottom of the Vessel, is known by the Name of Lees, Sediments, Feculence, or Mother, that will, if raised again out of the Liquor into which it was precipitated, cause it to work afresh.

Thus, when a Hogshead of Wine has done fermenting, and is fined down, if the Vessel be any way shaken or disturbed, it will grow turbid again, and ferment anew, as Vintners very well know. For such as were the Flowers in the Act of Fermentation, such is the Mother after the Action is over.

5. Acid Paste, or Bakers Leaven, which is no more than any Kind of Meal brought into a close Lump by Means of Water, after the same Manner as common Bread is made; for this being set in a warm Place, during the Space of four or five Days, it will first smell, then turn very acid, and at length become a Ferment.

6. Those Ferments which reside in or stick to the Sides of, the Casks that have contained fermenting Liquors; for such Casks will of themselves raise a Fermentation in the Liquors committed to them; and *Helmont* was of Opinion, they might be capable of doing this for ever.

Upon Account of this inherent Ferment it is, that old-seasoned Vessels, or such as have been long employed by Vintners or Brewers, bear so great a Price among them.

It is very remarkable, though a Thing well known to Brewers and Vintners, that a new Cask checks the Fermentation of vinous Liquors, and renders them weak and spiritless; for which Reason they never choose to make use of such a Cask before it is seasoned, as they call it by having first contained some spirituous or fermented Liquor or other; which being plentifully drank in by the Wood, the original Liquor comes to be deprived of a large Proportion of its Spirit, and more fermentable Part; whence the Remainder must needs taste flat and vapid.

This is certain, that even Must itself will not easily ferment in a new pure Vessel; but with the greatest Facility, if put into one that has before contained fermenting Juices; for the Parts of the fermenting Liquors, with which such a Vessel must have been impregnated, presently rouse and determine it to Action.

7. There are some Ferments that appear to be heterogeneous, or which are improperly called Ferments; as the White of an Egg beat into a Froth, which is used when the Liquor to be fermented proves too dilute or thin to sustain the Operation. For in this Case the fermentable Parts of the Fluid easily extricate themselves, and so fly off for want of something to detain and keep them in the Body of the Liquor; which there-

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fore requires some viscid Substance to be mixed with it, in order to prevent this Avolation of its subtile Parts. And this cannot be more commodiously effected, than by the White of an Egg.

8. Of the like heterogeneous Kind of Ferments are all fixed and acid Salts. Thus, if the Liquor designed for Fermentation be too acid to work kindly, the Addition of an alkaline Salt, as that of Vine Branches, or any saponaceous Substance, will, by taking off from the Acidity, fit it for, and so promote the Operation; but if the Liquor be of itself too alkaline, then Tartar, or the like, ought to be added to it, to promote the Fermentation.

But this does not happen, because either the acid or alkaline Salt is an actual Ferment, as some Chymists have vehemently contended for the alkaline, because the Salts employed respectively temper and take down the predominant Acid or Alkali, which before hindered the Fermentation of the Liquor.

And if such Salts should in due Quantities be mixed with any proper Subject of Fermentation, possessed of all the Qualities before set down, as requisite to it, the Operation would be entirely checked and prevented; so that alkaline Bodies may as well be said to hinder, as promote Fermentation.

9. And lastly; Of the same Sort are certain austere or rough tasted Substance; as all harsh and green Fruit, Poingranate Bark and Flowers, the Tamarisk Bark, Crab Apples, unripe Medlars, &c. which, when the Liquor designed for the Fermentation is too much broken in its Parts, or dissolved in its Texture, bind it together again by its astringent Quality; so that though it was before too thin and aqueous, it is now reduced to a proper Consistence for Fermentation.

Thus, when Must proves thin and watery, it will not ferment kindly, unless some austere or astringent Ingredient, as red Rose Leaves, or the like, be added to it, to thicken and improve its Consistence, and at the same time prevent the Air it contains from making too early an Escape.

But when a Liquor is too austere, or its Roughness proves so great, that it cannot ferment, the Addition of a fixed Alkali, in a proper Quantity, will remove the Obstruction, and leave it at Liberty to work.

So likewise when the Operation is prevented by too large a Proportion of Acid in the Liquor, the Method is to throw Chalk, Crabs Eyes, Bole Armoniack, or the like, into it; but if it be too unctuous or oily, as is the Case of some *Spanish* Wines, Salt of Tartar is made choice of; and thus, as Circumstances alter, different Bodies are employed to stop or promote Fermentation in Liquors.

In order for fitting the Subjects of the second Class for Fermentation, and making vinous Liquors; viz. pulpy Summer Fruits, and the Roots of bulbous Plants; in Case they prove crude or hard, are to be first boiled in Water, and afterwards bruised; which will dispose them for Fermentation; but if such Subjects are juicy, they may be directly ground to a Pulp; or have their Juice pressed from them; or if they are very succulent, there may be no Occasion to bruise them, only directly to commit them to the Press, and squeeze out all their Juice.

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But if the Flesh or Substance be strong and tough, it may be proper to rasp, shave, or cut them into small Pieces, which will be of Service in some bulbous Roots, and make them yield their Juice with the greater Ease, and in greater Plenty.

Prepared Fruits seldom stand in need of any Thing to make them ferment; for they generally begin to work of their own Accord; but if the Weather should prove exceeding cold, or the Operation proceed but languidly, it may not be amiss to quicken it by adding a small Proportion of a Ferment, as a little Yeast, the Lees or Mother of Wine; or even a little new Wine may serve the Turn.

The Subjects of the Third Class; viz. the succulent Parts of Plants; need only, in order to their Fermentation, be beat to a thick Kind of Pulp, while they are fresh, and mixed with a proper Proportion of Rain Water, that is just enough to dilute them; for if much Water be employed, the Spirit will be the weaker for it.

These require but very little Ferment, or none at all, to make them work in the Summer Season; and no large Proportion in the Winter; but in Case any at all be required, nothing will prove more serviceable than Honey or Sugar.

The Subjects of the fourth and fifth Classes; viz. the fresh native Juices, and weeping Liquors of Vegetables, with the condensed and unctuous Juices of the same, are to be diluted and let down with Rain Water, to a due Consistence; which is then thought to be obtained, when the compound Liquor will just keep a new laid Egg afloat; but some vegetable Juices may naturally be of this very Density or Consistence; and in that Case they will require no Water at all. If any be thicker or denser, they ferment not so kindly; and if thinner or rarer, they afford but a weak Spirit. Thus, in order to ferment Sugar, Treacle, or any common Syrup, we first let down the Matter with Water, to the Consistence above mentioned; and then, if there be Occasion, put Yeast to it, to quicken the Fermentation, and make it proceed kindly.

The Subjects of the fourth Class; viz. the prepared recent Juices, and spontaneous Tears of Vegetables; are so far from requiring any Ferment, that it often proves very difficult to restrain or check the Fermentation they naturally fall into, especially if the Season be warm, and the Juices rich; at most, if the Weather should prove cold, they need only be set in a warm Place to make them work.

The Subjects of the fifth Class; viz. the prepared or inspissated Juices of Vegetables; require no Ferment at all in the Summer, and but a small Proportion in Winter, to set them working; less than an Ounce of Yeast to twenty Pints of prepared Liquor, will usually do for that Purpose in the coldest Season: but in hot Countries, or sultry Seasons, these prepared Juices, and especially Sugar, are of themselves apt to fall into too violent Fermentation; which therefore ought to be abated by the contrary Means.

All the Vegetable Bodies of the several Classes designed for fermentation, and prepared for it in the foregoing Manner, ought, together with their Ferments to be committed to Casks of Oak already seasoned with the same Kind of fermented Liquor,

or some other, consisting of subtil and penetrating Parts. Then those Casks or Vessels having their Bung Holes lightly covered with a thin or single Cloth, and being set in a warm Place, the Liquor will ferment.

The Mouths of the Vessels are thus slightly covered over, that the Air may have a free Passage in and out of them; for they are here designed to serve as Vent Holes; and these Vessels are ordered of Wood, because Fermentation is never observed to be so well carried on in those of glazed Earth or Glass; though on Account of their Transparency, it is sometimes performed in the latter, that the *Phænomena* may be better observed.

The preparatory Business of Fermentation, hitherto described has been carried on by Art; but Nature must now perform the rest of the Work; so that we are here only concerned to observe the *Phænomena* which a rise in the Operation.

When therefore any fermentable Body is prepared after the Manner above delivered, and with its due Proportion of a Ferment, committed to a large strong Glass Vessel, standing in a warm Place;

1. The whole Body of the Liquor soon begins to swell, heave, rarefy, and send up little Bubbles to the Top of the Vessel, where they burst with an audible Noise, and form into Froth. Now the Liquor which was before transparent, grows opaque, and a violent interrupted intestine Motion manifests itself therein.

2. The Parts of the fermenting Fluid appear to be incredibly elastick, and the Motion of them exceeding violent. Indeed, by means of this Property of Fermentation, very terrifying and surprising Actions may be performed. Thus if a Hundred Pints of Must were, on some warm Day in Autumn, to be confined close in a Vessel of Oak above an Inch thick in the Sides, and made ever so tight and strong with Iron Hoops, yet could not this prevent the working of the Liquor; but in Spite of so great a Resistance, it would burst the Vessel, with a Report as loud as that of a Cannon.

And therefore the Way to preserve new Wine in the State of Must is, to put it up in very strong, but small Casks, firmly closed on all Sides; by which Means it will be kept from fermenting; and then it goes by the Name of Stum: but if it should happen to fall into Fermentation, the readiest and only Way to stop it, is by the Fume of Sulphur, or something of the like Nature.

Were it not for the Knowledge of this Property of burning Sulphur, the Wine Merchants and Vintners might frequently sustain great Damages from the bursting of their Vessels, when the Liquor is upon the Fret, or, by some Alteration in the Air, or other Accident, begins to ferment again; but the Smoke of a little common Brimstone, or a lighted Match dipped in it, and held under a Cask of Wine that is just ready to burst its Hoops, will calm its Fury, and make it subside as suddenly as a Spoonfull of Oil, thrown into a large foaming Copper of boiling Sugar, takes down its Heat, and prevents the Mischief it might otherwise occasion.

3. A thick Skin, or crusty Scurf, forms itself on the Surface, through which the elastick or fermenting Matter is continually breaking. This Crust appears to be the principal Cause of Fermentation; for it keeps in, or prevents the spirituous Part of the Liquor from flying

flying off; and if it be frequently broken, it puts a Check to the Fermentation, and will often entirely stop it, if wholly taken away.

4. This Skin or Crust, which we now call Flowers or Yeast, gradually consumes and precipitates to the Bottom of the Liquor; in which Case it is called by the Name of *Fæces* or Mother; and after this, the Fluid above it immediately becomes transparent again, ceases to hiss and bubble, has a very penetrating, pungent, spirituous, or vinous Taste and Scent, with a Mixture of Acidity and Sweetness. And now the Liquor, having undergone the Operation of Fermentation, is become Wine.

The Vapour arising from the Liquor, during its Fermentation, ought not to be approached too near, or breathed in too great a Quantity, because it is highly poisonous; and, if it prove not mortal, may at least render the Person apoplectick and paralytick. We have Accounts in the *French* and *German* Transactions, of People who were immediately struck dead, by receiving at the Nose the Fumes that issued from large Vessels of Wine, in the State of Fermentation.

And now, if the Liquor thus fermented be stopped down close, it will begin to feed upon, and digest its own Lees or Mother, and at length consume them; in which Case we commonly say, the Wine begins to ripen; and afterwards, this Mother shoots to the Sides of the containing Vessel, and there appears in the Form of an essential Salt, which is then called Tartar.

The Space of Time required for finishing the Fermentation differs with the subject Matter, the Season of the Year, the Nature of the Place, and other Circumstances; but it is known to be perfectly performed by the several *Phænomena* just now mentioned.

As soon as the Flowers fall to the Bottom, the Vessel should be bunged down, otherwise the volatile Part would fly off, and the fermented Liquor become vapid and flat.

In this State it ought to stand for some Weeks in a cool Place, by which Means it will grow stronger, and more liquid; for during this Time, it imbibes and consumes its own *Fæces*, which abound in subtle spirituous Parts, and grows soft, and loses of its Acidity, by throwing off its Tartar.

And the longer it is thus suffered to stand the more Strength it gains, or the more Spirit it will yield in Distillation.

Thus, for Instance; Malt Liquors, newly brewed, afford but a small Quantity of inflammable Spirit; but if suffered to remain for some Weeks in the Vessel, till they become fine and clean, they will yield a much greater Proportion; though, to avoid so great an Apparatus of Vessels as would then be required, Malt Liquors, brewed, in order to make Spirits are seldom kept; but immediately after Fermentation committed to the Still. And hence we are furnished with a Reason, why all stale, vinous Liquors are stronger, and inebriate sooner, than such as are new.

The Physical Effects.

The Physical Properties of a vinous Liquor, prepared in the Manner above described, are those which follow:

1. It will have an inebriating Quality, when received

into the Body; and nothing is properly possessed of this Quality, but what has been first fermented.

For if a Person should eat ever such a Quantity of Grapes, or drink ever so freely of Must, he might indeed, bring a Looseness upon himself by that Means, but he would not be fuddled. So likewise, to take down large Draughts of Sweet-wort, or the Tincture of Malt, might throw one into a violent Vomiting and Flux, but never produce the Symptoms of Drunkenness.

And whatever some pretend, as to Mandrake, Hemlock, Poppies, Opium, and the like, the Effects they have upon the human Body are rather stupefying than inebriating; but Drunkenness is different from Stupor.

An over Dose of vinous Liquors makes a Man brisk, lively, and joyful; or disposes him to sing, dance, or be merry; at length however, his Legs will not support him; and, if the Fit be violent, he grows furious, raging, or paralytick, and so he dies.

But Opium has not these Effects; it brings on a profound Sleep; and he who has taken too much of it, dies lethargick.

2. Wine has the Faculty of heating the Body. Nothing appears to cool the Body more than Currants; yet the Wine prepared from them is very heating. The like is to be understood of Cherries, and all fermentable Bodies, though ever so cold; for these will afford a vinous Liquor.

3. It is inflammable, and will mix with Water.

4. It contains Tartar, and affords it after the Fermentation is over. This Tartar is the essential Salt of the Vegetable made use of, and differs from the Lees or Mother; being resolvable by Distillation into a Water, a Spirit, two Kinds of Oil, an alkaline Salt, and Earth. All fermented Vegetables afford it. Must yield a feculant Salt, and no Tartar; but if once it works, so as to become pure Wine, it will, in the Space of half a Year, throw off a clean Tartar, which therefore appears to be the Effect of a perfect Fermentation, and accordingly is never obtained without it.

5. It retains neither the Colour, Taste, nor Smell of the specific Vegetable, from which it is made. Thus we have seen, that Rosemary affords a quite different Water, after it has been fermented, from what it did before. Thus fermented Hydromel, Malt Liquors, Treacles, Sugar, &c. yield Spirits by Distillation, that cannot be distinguished from one another.

The Grapes of some Countries are as sweet as Honey, and so is their Must before Fermentation, yet the Wine, prepared from either, may have little or no Sweetness, and sometimes even gain a Degree of Acidity. It is not easy to believe, that Rhenish Wine should proceed from so sweet a Grape as it does.

6. It acquires a somewhat acid and spirituous Taste and Smell. The Taste of Honey, or Malt, &c. is sweet, and their Scent scarce perceivable, before you commit them to Fermentation; but, after having undergone that Operation, they are less sweet, but sharper upon the Tongue, and affect the Nose with a brisk, spirituous, or vinous Odour.

7. It contains the volatile Salt and Oil of the Vegetable, attenuated, and reduced into one Spirit, as may

may appear by the chemical Analysis of a fermented Subject.

8. It renders the Oil of the Vegetable more volatile than the Water. When an unfermentable Vegetable is distilled, the first Thing that comes over is Water, and the next the essential Oil, but the contrary is observed after Fermentation; for, by that Operation, the Oil is rendered more volatile than the Water, and therefore rises first in Distillation, having been broken and ground so fine by the preceding Operation, as now to come over the Helm, not in its own Form, as before, but as the finest and most volatile Part of the fermented Liquor, capable of uniting with Water.

The Things that promote Fermentation are,

1. Rest; by Means of which the Crust on the Surface may remain unbroken, for it is this Crust that prevents the spirituous Part from flying off.

2. A free Admission of the external Air, so that it may come at the internal Parts of the fermenting Fluid; for, according to Mr. Boyle, if a fermenting Liquor be put into his exhausted Receiver, the Operation immediately ceases.

3. A moderate Degree of Warmth; for too great Heat, and too great Cold, are the Bane of Fermentation.

4. A proper Season of the Year; that is, when the Vegetables of the same Species with that made use of are in their Bloom, for it is then their Juices are most in Motion; accordingly we find, when Vines are in the Blossom, the Wines of former Growths will again spontaneously run into Fermentation. When these several Conditions meet, Fermentation is performed to the best Advantage.

The Things which check or hinder Fermentation are,

1. Too large a Proportion of acid Salts; such as Spirit or Oil of Vitriol, Oil of Sulphur *per Campanam*, Spirit of Salt, &c. Thus, when any Liquor ferments too violently, a few Drops of Oil put into it, or the burning a little Sulphur under or near the Vessel will immediately check and restrain its Fury.

2. An over-proportion of fixed Alkalies; such are Salt of Tartar, Pot Ashes, or saponaceous Bodies.

3. Terrestrial Alkalies; as Chalk, Marl, Crabs Eyes, &c.

4. A close Stopping up of the Vessel.

5. A great Degree of Cold.

6. A violent Compression of the Air in the Vessel, which, Mr. Boyle has shewn, will stop Fermentation, as well as taking out the Air by Means of his pneumatick Engine.

Some short general Directions as to the making of Wines.

Wine is made of Grapes, by stamping them in a Vat, or crushing and expressing the Juice out of them in a Press, and then fermenting, &c.

In the southern Parts of France their Method is, for red Wines, to tread the Grapes, or squeeze them between their Hands, and to let the Whole stand, Juice and Husks, till the Tincture be in Colour as they would have it, and then they press it, but for white Wines, they press the Grapes immediately.

When they have been pressed, they run the Must, and stop up the Vessel, leaving the Cask empty about

the Depth of half a Foot, or better, to give Room for its working.

At the End of ten Days they fill this Space with some other proper Wine, that will not provoke it to work again; repeating this every ten Days for some Time: New Wine spending itself a little before it be perfect.

About Paris, and in the northern Parts of France, they let the Marc and Must stand two Days and Nights for white Wines, and at least a Week for Claret Wines, before they tun it, and while it continues working, they keep it as warm as possible.

Some, upon stopping it up for good and all, roll the Cask about the Cellar to mix it with the Lees, and after it has been settled a few Days, rack it off with great Improvement.

To fine it down, they put Shavings of green Beech into the Cask, but they first take off all the Rind, and boil them an Hour in Water to extract their Rankness, and afterward dry them in the Sun, or an Oven. A Peck of these will serve for a Hoghead of Wine; they put it in a gentle Working, and purify it in twenty four Hours; they also give it an agreeable Flavour.

Some sweeten their Wines with Raisins of the Sun, trod in the Vat with the Grapes, they having been first plumped by boiling; others by boiling half the Must, scumming it, and tunning it up hot with the other.

Wine is distinguished, from the several Degrees and Steps of its Preparation, into,

1. *Mere-Goute*, Mother-drop, which is the Virgin Wine, or that which runs of itself out of the Tap of the Vat, before the Grapes are trodden.

2. The Must, Surmoult, or Scum, which is the Wine or Liquor in the Vat, after the Grapes have been trodden in the Vat.

3. The pressed Wine, or *Vin de Pressurage*, which is that squeezed with a Press out of the Grapes half-bruised by treading.

4. *Boisson*, or Draught Wine. This is made of the Husks left of the Grapes, which are called Rape or Marc; by throwing Water upon which, and pressing afresh, they make a Liquor for Servants.

Wines are also distinguished into

Vin doux, or Sweet Wine, which is that which has not yet worked nor boiled.

Borsu; that which has been prevented working by casting in cold Water.

Wine of the Cuve, or worked Wine, i. e. that which has been let to work in the Vat to give it a Colour.

Vin cuit, i. e. boiled Wine; that which has had a Boiling before it worked, and which, by that Means, still retains its native Sweetness.

Vin passe, i. e. strained Wine; that which is made by steeping dry Grapes in Water, and letting it ferment of itself.

The Goodness of Wine consists in its being neat, dry, clear, fine, brisk, without any Taste of the Soil, of a clean steady Colour; in its having a Strength, without being heady, a Body, without being sour, and its keeping, without growing hard.

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After Wines have been made, they require to be managed according to their different State and Circumstances. We shall therefore consider them under these four general Heads following:

1. The natural Purification or Clarification of Wines, whereby, of themselves, they pass from the State of Crudity and Turbulency, to that of Maturity, by Degrees growing clear, fine, and potable.

2. The unseasonable Workings, Frettings, and other Sicknesses, to which, from either internal or external Accidents, they are afterward subject.

3. Their State of Declination or Decay, wherein they degenerate from their Goodness and Pleasantness, becoming palled, or turning into Vinegar.

4. The several Artifices used to them, in each of these States and Conditions. As to the first, viz. the natural Clarification of new Wines, two Things occur, which deserve Consideration; the Manner how, and the Cause by which, the same is effected.

As for the Manner; it is to be observed, that Wine, while yet in the Must, is usually put into open Vessels, the Abundance and Force of the Spirits, i. e. the more subtil and active Parts therein contained, being then so great, as not to endure being imprisoned in close ones; at which Time it appears troubled; thick, and teulent, all Parts of it being violently moved, and agitated, so that the whole Mass of the Liquor seems to boil like Water in a Caldron over the Fire.

This Tumult being in some Degree composed, and the *Gas sylvestre* (as *Van Helmont* calls it,) or wilder Spirit, sufficiently evaporated, they then pour the Must into close Vessels, there to be farther defecated by Continuance of the same Motion of Fermentation, reserving the Froth or Flower of it, and putting the same into small Casks hooped with Iron, lest otherwise the Force of it might break them.

This Flower, thus separated, is what they call *Stum*, either by Transposition of the Letters in the Word Must, or from the Word *Stum*, which, in *Higb Dutch*, signifies *Mute*, because this Liquor, as (one may say) is hindered from that Maturity, by which it should speak its Goodness and Wholeness.

This being done, they leave the rest of the Wine to finish its own Fermentation, during which it is probable that the spirituous Parts impel and diffuse the grosser and feculent Parts up and down in a confused and tumultuous Manner, until, all being disposed in their proper Regions, the Liquor becomes more pure in Substance, more transparent to the Eye, more piquant and gustful to the Palate, more agreeable to the Stomach and more nutritive to the Body.

The Impurities, being thus separated from the Liquor, are, upon chemical Examinations, found to consist of Salt, Sulphur (each of which is impregnated with some Spirits,) and much Earth, which, being now dissociated from the purest Spirits, either mutually cohere, coagulate, and affix themselves to the Sides of the Vessels, in Form of a stony Crust, which is called Tartar and Argol, or sink to the Bottom in a muddy Substance, like the Grounds of Ale or Beer, which is called the Lees of Wine. And this is the Process of Nature in the Clarification of all Wines, by an orderly Fermentation.

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As for the principal Agent, or efficient Cause, of this Operation, it seems to be no other but the Spirit of the Wine itself, which, moving every Way in the Mass of the Liquor, thereby dissolves that common Tye of Mixture, whereby all the heterogeneous Parts thereof were combined and blended together; and having gotten itself free, at length abandons them to the Tendency of their Gravity, and other Properties, which, they soon obeying, each Kind comforts with its like, and, betaking themselves to their several Places or Regions, leave the Liquor to the Possession and Government of its noblest Principle, the Spirit. For this Spirit, as it is the Life of the Wine, doubtless is also the Cause of its Purity and Vigour, in which the Perfection of that Life seems to consist.

From the natural Fermentation of Wines, we pass to the accidental; from their State of Soundness, to that of their Sickness, which is the second general Head.

We have the Testimony of Experience, that frequently even those Wines that are good and generous are invaded by unnatural and sickly Commotions, or (as the Wine Coopers call them) Workings; during which they are turbulent in Motion, thick of Consistence, unfavoury in Taste, unwholesome in Use, and, after which, they undergo sundry Alterations for the worse.

The Causes of this may be either internal or external.

Among the internal, the chief Place may be assigned to the excessive Quantity of Tartar, or of Lees, which contain much Salt and Sulphur, and continually send forth into the Liquor Abundance of quick and active Particles, that like *Stum*, or other adventitious Ferment, put it into a fresh Tumult or Confusion, which, if not in Time allayed, the Wine either grows rank or pricking, or else turns sour, by Reason that the Sulphur, being too much exalted above the Rest of the Elements or Ingredients, predominates over the pure Spirits, and infects the whole Mass of Liquor with Sharpness or Acidity; or else it comes to pass, that the Spirits being spent and flown away in the Commotion the Salt, dissolved, and set afloat, obtains the Mastery over the other similar Parts, and introduceth Rankness or Ropiness.

Nay, if those Commotions chance to be suppressed before, the Wine is thereby much depraved, yet do they always leave such ill Impressions, as, more or less, alienate Wine from the Goodness of its former State, in Colour, Consistence, and Taste.

For hereby all Wines acquire a deeper Tincture, i. e. a thicker Body or Consistence; Sacks and white Wines changing from a clear White to a cloudy Yellow; and Claret losing its bright Red for a dusky Orange Colour, and sometimes for a Tawney. In the like Manner degenerate also in Taste, and affect the Palate with Foulness, Roughness, and Rancidity, very unpleasant.

Among the External are commonly reckoned the too frequent or violent Motion of Wines, after their Settlement in their Vessels; immoderate Heat, Thunder, or the Report of Cannon, and the Admixture of any exotic Body, which will not symbolize or agree and incorporate with them; especially the Flesh of Vipers, which

has

has been frequently observed to induce a very great Acidity upon even the sweetest and fullest-bodied *Malaga* and *Canary* Wines.

This brings us, in the next Place, to the third previous Thing considerable; viz. the palling or flattening of Wines, and their declining towards Vinegar, before they have attained to their State of Maturity and Perfection.

Of this the greatest and nearest Cause seems to be their Jejuneness and Poverty of Spirits, either native or adventitious:

Native, when the Grapes themselves are of a poor and hungry Kind, or gathered unripe, or nipt by early Frosts, or half starved in their Growth, by a dry and unkindly Season, or too full of watery Parts:

Adventitious, when the Liquor, rich perhaps, and generous enough at first, comes afterwards to be impoverished by Loss of Spirits, either by Oppression, or by Exhaustion.

The Spirits of Wine may be oppressed, when the Quantity of Impurities or Dregs, with which they are combined, is so great, and their Crudity, Viscosity, and Tenacity, so stubborn, that they can neither overcome them, nor deliver them from their Adhesion; but are forced to yield to the Obstinacy of the Matter on which they should operate, and so to remain unactive and clogged; as may be exemplified in the coarse Wines of *Moravia*, which, by Reason of their great Austerity and Roughness, seldom attain to a due Exaltation of their Spirits, but still remain turbulent, thick, and in a State of Crudity, and therefore easily pall; in which Respect they are condemned by some *German* Physicians, as bad for generating the Scurvy, and administering Matter for the Stone and Gout, the yielding more of Tartar than other Wines.

The Spirits of Wine may be exhausted or consumed, either suddenly or gradually; suddenly, by Lightning, which spoils Wine, not by Congelation or Fixation of its Spirits; for then such Wines might be capable of being restored by such Means as are apt to reinforce and volatilize the Spirits again, contrary to what hath been found by Experience; but perhaps by Disgregation, and putting them to flight, so as to leave the Liquor dead, palled, and never to be revived by any Supply.

Gradually, two Ways; viz. by unnatural Fermentation; of the ill Effects of which, something has been already said; or by Heat from without; of which we have an Instance in the making of Vinegar; which commonly is done by setting the Vessels of Wine against the hot Sun, which, beating upon the Mass of Liquor, and rarefying the finer Parts thereof, gives Wings to the fugitive Spirits to fly away together with the purer and more volatile Sulphur, leaving the Remainder to the Dominion of the Salt, which soon debaseth and infecteth it with Sourness.

This being the common Manner of turning Wine into Vinegar, in all Ages, and all Countries, it may be doubted, whether Spirit of Wine may be drawn out of Vinegar, notwithstanding it hath been delivered as practicable by *Senertus* himself.

The Times of the Year when Wines are observed to be most prone to ferment and fret, and then to grow

qually (as it is called,) that is, turbulent and foul, are *Midsummer* and *Allballowtide*, when our Vintners are wont to rack them from their gross Lees, especially Rhenish, which commonly grows sick in *June*, if not racked; and they choose to do it in the Wane of the Moon, and fair Weather, the Wind being notherly.

Having thus succinctly recounted the most remarkable Distempers of Wines, guessed at their respective Causes, and touched upon the Times, it is proper to proceed to their usual Remedies; such, at least, as may be collected from *Wine Coopers* and *Vintners*; which is the fourth and last Part proposed to be treated of.

To begin therefore with some of the Artifices used to Wines when yet in Must; it is observable, that though, to raising a Fermentation in them at that Time, there is not so much need of any additional Ferment, as there is in the Wort of Ale, Beer, Hydromel, Metheglin, and other Sorts of Drinks, familiar to us in *England*; because the Juice of the Grape is replenished with generous Spirits, sufficient of themselves to begin that Work; yet it is usual in some Countries to put quick Lime either upon the Grapes, when they are pressing, or into the Must; to the end that, by the Force and Quickness of its saline and fiery Particles, the Liquor may be both accelerated and assisted in working.

For the same Reason, perhaps, it is, that the *Spaniards* mix with their Wines, while they are yet flowing from the Press, a certain Thing they call *Gesso*, which probably is a Kind of *Gypsum* or Plaster, whereby the Wines are made more durable, of a paler Colour, and pleasanter Taste; others put into the Cask Shavings of Fir, Oak, or Beech, for the same Purpose.

Again; though the first Fermentation succeeds generally well, so that the whole Mass of Liquor is thereby delivered from the gross Lee; yet sometimes it happens either through Scarcity of Spirits at first, or through immoderate Cold, that some Part of those Impurities remain confused and floating therein.

Now, in this Case, Wine Coopers put into the Wine certain Things to hasten and help its Clarification; such as, being of gross and viscous Parts, may adhere to the floating Lee, and, sinking, carry it with them to the Bottom; of which Sort are, *Isinglass*, and the Whites of Eggs, or such as, meeting with the grosser and earthy Particles of the Lee, dissociate and sink them by their Gravity; of which Kind are the Powders of *Alabaster*, calcined *Flints*, white *Marble*, *Roach Alum*, &c.

The *Grecians*, at this Day, have a peculiar Way of spurring Nature, in fining and ripening their strongest and most generous Wines; and this is done by adding to them, when they begin to work, a proportionate Quantity of Sulphur and Alum; not (as is very probable) to prevent their fuming up to the Head, and inebriating, according to the Conjecture of that great Man, the Lord *St. Albans*; for, notwithstanding this Mixture, they cause Drunkenness as soon, if not sooner, than other Wines; nor are Men intoxicated by the Vapours of Wine flying up immediately from the Stomach into the Brain; but only to excite and promote Fermentation, and hasten their Clarification that ensues there-

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thereupon; the Sulphur perhaps helping to attenuate and divide those gross and viscid Parts, wherewith *Greek Wine* abounds; and the Alum conducing to the speedier Precipitation of them afterwards. And a learned Traveller relates, that some Merchants put into every Pipe of their *Greek Wine* a Jill, or thereabouts, of the chemical Oil of Sulphur, in order to preserve it the longer clear and sound:

Which, though it is very probable, because the Sulphur is known to resist Putrefaction in Liquors, yet one would decline the Use of Wines so preserved, unless in Time of pestilential Infection.

But of all the Ways of hastening the Clarification and Ripening of Wine, none seems to be more easy, or less noxious, than that borrowed from one of the Ancients by the Lord Chancellor *Bacon*; which is, by putting the Wine into Vessels well stopped, and letting it down into the Sea.

That this Practice was very ancient, is manifest from that Discourse of *Plutarch*, *Quæst. Natur.* 27. about the Efficacy of Cold upon Must; whereof he gives this Reason, That Cold, not suffering the Must to ferment, by suppressing the Activity of the Spirits therein contained, conserveth the Sweetness thereof a long Time; which is not improbable; because Experience teaches, that such as make their Vintage in a rainy Season, cannot get their Must to ferment well in a Vault, unless they cause great Fires to be made near the Casks; the Rain mixed with the Must, together with the ambient Cold, hindering the Motion of Fermentation, which arises chiefly from Heat.

That the same is frequent at this Day also, may be collected from what Mr. *Boyle* has observed in his *History of Cold*, on the Relation of a *Frenchman*; viz. that the Way to keep Wine long in the Must (in which the Sweetness makes many to desire it) is, to tun it up immediately from the Press; and, before it begins to work, to let down the Vessels, closely and firmly stopped, into a Well, or deep River, there to remain for six or eight Weeks; during which Time the Liquor will be so confirmed in its State of Crudity, as to retain the same, to gether with its Sweetness, for many Months after, without any sensible Fermentation.

But it may be objected, How can these two so different Effects, the Clarification of new Wine, and the Conservation of Wine in the Must, be derived from one and the same Cause, the Cold of the Water?

But this may be conceived without much Difficulty; for it seems not unreasonable, that the same Cold which hinders Must from fermenting, should yet accelerate and promote the Clarification of Wine after Fermentation; in the first, by giving a Check to the Spirit, before it begins to move and act upon the crude Mass of Liquor, so that it cannot in a long Time after recover Strength enough to work; in the latter, by keeping in the pure and genuine Spirit, otherwise apt to exhale; and rendering the flying Lee more prone to subside, and so making the Wine much sooner clear, fine, and potable. Thus much concerning the Helps of new Wine.

The general and principal Remedy for the preternatural or sickly Commotions incident to Wines after their first Clarification, and tending to their Impoverishment

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or Decay, is Racking; i. e. drawing them from their Lees into fresh Vessels.

Which yet being sometimes insufficient to preserve them, Vintners find it necessary to pour into them a large Quantity of new Milk, as well to blunt the Sharpness of the sulphureous Parts now set afloat and exalted, as to precipitate them, and other Impurities, to the Bottom, by Adhesion.

But, taught by Experience, that by this Means the genuine Spirits of the Wine also are much flatted and impaired (for the Lee, though it makes the Liquor turbid, doth yet keep the Wine in Heart, and conduce to its Duration;) therefore, lest such Wines should pall and die upon their Hands, as of Necessity they must, they draw them for Sale as fast as they can vend them.

For the same Disease they have divers other Remedies, particularly accommodated to the Nature of the Wine that needs them: To instance a few;

For *Spanish Wines* disturbed by a flying Lee, they have this Receipt: Make a *Parrell* (as they call it) of the Whites of Eggs, Bay Salt, Milk, and Conduit Water; beat them well together in a convenient Vessel, then pour them into a Pipe of Wine (having first drawn out a Gallon or two to make Room,) and blow off the Froth very clean; hereby the Tumult will in two or three Days be composed, the Liquor refined, and drink pleasantly, but will not continue to do so long; and therefore they advise to rack it from the milky Bottom, after a Week's Settlement, lest otherwise it should drink foul, and change Colour.

If Sacks or Canary Wines chance to boil over, draw off four or five Gallons; then putting into the Wine two Gallons of Milk, from which the Cream hath been skimmed, beat them till they are thoroughly mixed together, and add a Pennyworth of Roach Alum, dried in a Fire Shovel, and powdered, and as much of white Starch; after this take the Whites of eight or ten Eggs, a Handful of Bay Salt, and having beaten them together in a Tray, put them also into the Wine, filling up the Pipe again, and letting the Wine stand two or three Days; in which Time the Wine will recover to be fine and bright to the Eye, and quick to the Taste; but you must be sure to draw it off that Bottom very soon, and spend it as fast as you can.

For Claret, in like Manner distempered with a flying Lee, they make Use of this Artifice:

They take two Pounds of the Powder of Pebble Stones, baked in an Oven, the Whites of ten or twelve Eggs, a Handful of Bay Salt; and having beaten them well together, in two Gallons of the Wine, they mix them with that in the Cask, and after two or three Days draw off the Wine from the Bottom.

The same *Parrell* serves also for White Wines upon the Fret, by the Turbulency and Rising of their Lee.

To cure Rhenish of its fretting (to which it is most prone a little after Midsummer, as was before observed,) they seldom use any other Art but giving it Vent, and covering the oaken Bung with a Tile or Slate, from which they carefully wipe off the Filth purged from Wine by Exhalations; and after the Commotion is by this Means composed, and much of the fretting Matter cast forth, they let it remain quiet for a Fortnight,

night, or thereabouts, and then rack it into a fresh Cask, newly fumed with a sulphurated Match.

As for the various Accidents that frequently ensue, and vitiate Wine (after those before mentioned Reboilings, notwithstanding their Suppression before they were incurable); you may remember they have been all referred to such as alter and deprave Wines, either in Colour or Consistence, or Taste, or Smell. Now for each of these Maladies our Vintners are provided of a Cure.

To restore *Spanish* and *Austrian* Wines grown yellow or brownish, they add to them sometimes Milk alone, and sometimes Milk and Isinglass well dissolved therein; sometimes Milk and white Starch; by which they force the exalted Sulphur to separate from the Liquor, and sink to the Bottom; so reducing the Wine to its former Clearness and Whiteness.

The same Effect they produce with a Composition of Iris Roots and Salt-petre, of each four or five Ounces, the Whites of eight or Ten Eggs, and a competent Quantity of common Salt, mixed and beaten in the Wine.

To amend Claret decayed in Colour, first they rack it upon a fresh Lee, either of *Alicant* or red *Bordeaux* Wine; then they take three Pounds of Turnsole, and steep it all Night in two or three Gallons of the same Wine; and having strained the Infusion through a Bag, they pour the Tincture into a Hoghead (sometimes they suffer it first to fine itself in a Rundlet,) and then cover the Bung Hole with a Tile, and so let it stand for two or three Days, in which Time the Wine usually becomes well-coloured and bright.

Some use only the Tincture of Turnsole.

Others take half a Bushel of full ripe Elder Berries, pick them from their Stalks, bruise them, and put the strained Juice in a Hoghead of discoloured Claret, and so make it drink brisk, and appear bright.

Others, if the Claret be otherwise sound, and the Lee good, overdraw three or four Gallons; then replenish the Vessel with as much good red Wine, and roll it upon its Bed, leaving it reversed all Night; and then next Morning they turn it again, so as the Bung Hole may be uppermost; which stopped, they leave the Wine to fine.

But in all these Cases they observe to set such newly recovered Wines abroach the very next Day after they are fined, and draw them for Sale speedily.

To correct Wines faulty in Consistence, *i. e.* such as are lumpish, foul, or rosy;

They generally make use of the Powders of burnt Allum, Lime Chalk Plaster, *Spanish* white, calcined Marble, Bay Salt, and other the like Bodies, which cause a Precipitation of the gross and viscid Parts of the Wine then afloat: as for Example.

For Attenuation of *Spanish* Wines that are foul and lumpish, having first racked them into a newly scented Cask, they make a *Parrell* of burnt Allum, Bay Salt, and Conduit Water; then they add to these a Quart of Bean Flower, or Powder of Rice; and if the Wine be brown and dusky, Milk, otherwise not; and beating all these well together with the Wine, blow off the Froth, and cover the Bung with a clean Tile or Stone.

Lastly, They rack the Wine again after a few Days, and put it into a Cask well scented.

The Manner of scenting Casks is as follows:

They take four Ounces of Brimstone, one Ounce of burnt Allum, and two Ounces of *Aqua Vita*; these may be put together in an earthen Pan or Pipkin, and hold them over a chafing Dish of glowing Coals till the Brimstone is melted and runs; then they dip therein a little Piece of new Canvas, and instantly sprinkle thereon the Powders of Nutmegs, Cloves, Coriander, and Anise-seeds. This Canvas they fire, and let it burn out in the Bung Hole, so as the Fume may be received into the Vessel; and this is said to be the best Scent for all Wines.

To prevent the Foulness and Ropiness of Wines, the old *Romans* used to mix Sea Water with their Must.

To cure the Ropiness of Claret, the Vintners, as well *French* as *English*, have many Remedies; of which these that follow are the most usual:

First they give the Wine the *Parrell*, then draw it from the Lee, after the Clarification by that *Parrell*; this done, they infuse two Pounds of Turnsole in good Sack all Night; and the next Day, putting the strained Infusion into a Hoghead of Wine with a Spring Funnel, leave it to fine, and after draw it for excellent Wine.

Another is this: They make a Lee of the Ashes of Vine Branches, or of oaken Leaves, and pour it into the Wine hot, and after stirring, leave it to settle; the Quantity of a Quart of Lee to a Pipe of Wine.

A third is only Spirit of Wine; which, put into a muddy Claret, serves to the refining it effectually and speedily; the Proportion being a Pint of Spirit to a Hoghead; but this is not to be used in sharp and eager Wines.

When white Wines grow foul and tawny, they only rack them on a fresh Lee, and give them Time to fine.

For the mending of Wines that offend in Taste, Vintners have few other Correctives, but what conduce to Clarification; nor do they indeed much need Variety in the Case, seeing all Unfavourableness of Wines whatever proceeds from their Impurities set afloat, and the Dominion of others, their sulphureous or saline Parts, over the finer and sweeter; which Causes are removed chiefly by Precipitation.

For all Clarification of Liquors may be referred to one of these three Causes:

1. Separation of the grosser Parts of the Liquor from the finer.
2. The equal Distribution of the Spirits of the Liquor, which always renders Bodies clear and untroubled.
3. The Refining of the Spirit itself.

And the two latter are Consequents of the first, which is effected chiefly by Precipitation, the Instruments whereof are Weight and Viscosity of the Body mixed with it; the one causing it to cleave to the gross Parts of the Liquor flying up and down in it; the other sinking them to the Bottom.

But this being more than Vintners commonly understand, they rest not in Clarification alone, having found out certain Specificks, as it were, to palliate the several

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ral Vices of Wines of all Sorts, which make them distasteful. Of these I shall recite two or three of the greatest Use and Esteem amongst them.

To correct Rankness, Eagerness, and Pricking of Sacks, and other sweet Wines, they take twenty or thirty of the whitest Lime Stones, and slack them in a Gallon of the Wine; then they add some more Wine and stir them together in a half Tub, with a parrelling Staff; next they power this Mixture into the Hogthead, and having again used the parrelling Instrument, leave the Wine to settle, and then rack it.

This Wine may probably be no ill Drink for gross Bodies and rheumatick Pains; but injurious to good Fellows of a hot and dry Constitution, and meagre Habits.

Against the Pricking of *French* Wines they prescribe this easy and cheap Composition: Take of the Powder of *Flanders* Tile one Pound, of Roach Allum half a Pound; mix them and beat them well, with a convenient Quantity of Wine; then put them into the Hogthead, as the former.

When their Rhenish Wines prick, they first rack them off into a clean and strongly-scented Cask or Vat, then they add to the Wine eight or ten Gallons of clarified Honey, with a Gallon or two of Skim-milk; and, beating all together, leave them to settle.

Sometimes it happens, that Claret loses much of its Briskness and Piquantness; and in such Case they rack it upon a good Lee of red Wine, and put into it a Gallon of Sloes or Bullace, which, after a little Fermentation and Rest, makes the Wine drink brisk and rough.

To meliorate the Taste of hungry and too eager white Wines; they draw off three or four Gallons of it, and infusing therein as many Pounds of *Malaga* Raisins stoned, and bruised in a Stone Mortar, till the Wine has sufficiently imbibed their Sweetness and Tincture (which it will do in a Days Time), they run it through an Hippocras Bag; then put it into a fresh Cask well scented, together with the whole Remainder of the Wine in the Hogthead, and so leave it to fine.

To help stinking Wines, the general Remedy is racking them from their old and corrupt Lee; besides which, some give them a fragrant Smell or Flavour, by hanging in them little Bags of Spices, such as Ginger, Zedoary, Cloves, Cinnamon, Orris Roots, Cubebs Grains of Paradise, Spikenard, and other Aromaticks.

Others boil some of these Spices in a Pottle of good sound Wine of the same Sort, and tun up the Decoction hot.

Others correct the ill Savour of rank leed *French* Wine with only a few Cinnamon Canes hung in them.

Others again, for the same Purpose, use elder Flowers, and Tops of Lavender.

Having thus run over the Vintners Dispensatory, and described many of their principal Receipts or Secrets, for the Cure of the acute Diseases of Wine, we shall come to the fourth Head, which contains Medicaments, proper for their chronick Distempers; viz. Loss of Spirits, and Decay of Strength.

Concerning these, therefore, it is observable, that as when Wines are in preternatural Commotions, from an

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Excess and Predomination of their sulphureous Parts, the grand Medicine is, to rack them from their Lees, so or the contrary, when they decline, and tend towards palling, by Reason of the Scarcity of their Spirits and Sulphur, the most effectual Preservative is to rack them upon other Lees, richer and stronger than their own; that being from thence supplied with the new Spirits, they may acquire somewhat more of Vigour and Quickness.

I say, Preservative; because there is, in Truth, no restoring of Wines after they are perfectly palled and dead, for nothing that is past Perfection, and hath run its natural Race once, can receive much Amendment.

But besides reinforcing of impoverished Wines by new and more generous Lees, there are sundry Confections, by which also, as by Cordials, the languishing Spirits of many of them may be sustained, and, to some Degree, recruited, of which the following are Examples.

When Sacks begin to languish (which doth not often happen, especially in this City, where it is drank in Plenty); they refresh them with a cordial Syrup, made of most generous Wine, Sugar, and Spices.

For Rhenish and white Wines, a simple Decoction of Raisins of the Sun, and a strong-scented Cask, usually serve the Turn.

For Claret inclining to a Consumption they prescribe a new and richer Lee, and the Shavings of Fir Wood, that the Spirit, being recruited by the additional Lee, may be kept from exhaling by the unctuous Spirit of the Turpentine.

This Artifice is used in *Paris* in the most delicate and thin-bodied Wines of *France*, and is very probably the Cause of that exceeding Dullness and Pain of the Head, which always attends Debauches with such Wines.

Nor is it a modern Invention, but well known to, and frequently used by the *Romans*, in the Time of their greatest Wealth and Luxury; for *Pliny* (*Hist. Nat. lib. 14. cap. 2.*) takes singular Notice of the Custom of the *Italian* Vintners in mixing with their Wines Turpentine of several Sorts.

The *Grecians* long before had their *Vina Picata* and *Resinata*, as is evident by the Commendation of such Wines by *Plutarch*, and the Prescription of them to Women, in some Cases, by *Hippocrates*, and they were so much delighted with their *Vinum Pissites*, that they consecrated the Pitch Tree to *Bacchus*; but I shall next take some Notice of the more disingenuous Practices of Vintners in the Transmutation or Sophistication, which they call Trickings or Compassings.

They transform poor *Rochelle* and *Coniac* white Wines into Rhenish; Rhenish into Sack; the Lags of Sack and *Malmseys* into *Muscadels*.

They counterfeit *Raspie* Wine with *Fleur de lys* Roots; *Verdea* with Decoctions of Raisins; they sell decayed *Xeres*, vulgarly Sherry, for *Lusenna* Wine; in all these Impositions deluding the Palate so nearly, that few are able to discern the Fraud, and keeping these *Argana* so close, that few can come to the Knowledge of them.

As for their Metamorphosis of White into Claret, by

by dashing it with Red, nothing is more commonly either done or known.

For their Conversion of White into Rhenish they have several Artifices to effect it, among which this is the most usual.

They take a Hoghead of *Rochelle*, or *Coniac*, or *Nantz* white Wine; rack it into a fresh Cask strongly scented; then give the white *Parrell*; put into it eight or ten Gallons of clarified Honey, or forty Pounds of coarse Sugar, and, beating it well, leave it to clarify.

To give this Mixture the delicate Flavour, they sometimes add the Decoction of the yellow Clary Flowers, or *Galitricum*, of which Drugs there is an incredible Quantity used yearly at *Dort*, where the Staple of Rhenish Wines was; and this is that Drink with which the *English* Ladies were wont to be so delighted, under the specious Name of *Rhenish in the Must*.

The Manner of making adulterate *Bastard* is thus:

Take four Callons of white Wine, three Gallons of old *Canary*, five Pounds of *Bastard* Syrup; beat them well together, put them into a clean Rundlet well scented, and give them Time to fine.

Sack is made of Rhenish, either by a strong Decoction of *Malaga* Raisins, or by a Syrup of Sack, Sugar, and Spices.

Muscadel is sophisticated with the Lags of Sack or *Malmsey* thus:

They dissolve it in a convenient Quantity of Rose Water, of Musk two Ounces, of *Calamus Aromaticus* powdered one Ounce, of Coriander beaten half an Ounce, and while this Infusion is yet warm, they put it into a Rundlet of old Sack or *Malmsey*, and this they call a Flavour for *Muscadel*.

There are many other Ways of adulterating Wines in this City; but because they all attend to the above-mentioned Alterations, and are not so general, I shall pass them over, and mention the Observations of a certain curious Authour on this Subject.

The Mystery of Wines consists in the making and meliorating of natural Wines.

Melioration is either of sound or vicious Wines. Sound Wines are bettered,

1. By Preserving.
2. By timely Fining.
3. By mending Colour, Smell, or Taste.

1. To preserve Wines, Care must be taken, that after the Pressing they may ferment well, for without good Fermentation they become qually, *i. e.* cloudy, thick, and dusky, and will never fine themselves, as other Wines do, and when they are fined by Art, they must be speedily spent, or else they will become qually again, and then will not be recoverable by any Art.

To preserve *Spanish* Wines, and chiefly *Canary*, and therefore principally that which is *razie*, which will not keep long, they make a Layer of Grapes and *Giesse*, whereby it acquires a better Durance and Taste, and a white Colour, most pleasing to the *English*.

Razie Wine is so called, because it comes from Rhenish Vine Cuttings, sometimes renewed. The Grapes of this Vine are fleshy, yielding but a little Juice.

The *French* and Rhenish Wines are chiefly and commonly preserved by the Match, thus used at *Dort* in *Holland*.

They take twenty or thirty Pounds of Brimstone, rack into it melted, as Cloves, Cinnamon, Mace, Ginger, and Coriander Seeds; and some, to save Charges, use the Reliques of the Hippocras Bag, and, having mixed these well with the Brimstone, they draw through this Mixture, long, square, narrow Pieces of Canvas, which Pieces, they light, and put into the Vessel at the Bung Hole, and presently stop it close: Great Care is to be had in proportioning the Brimstone to the Quantity and Quality of the Wine, for too much makes it rough. This Smoking keeps the Wine long white and good, and gives it a pleasant Taste.

There is another Way for *French* and Rhenish Wines, *viz.* Firing it. It is done in a Stove, or else a good Fire made round about the Vessel, which will gape wide yet the Wine never runs out. It will boil, and afterwards may soon be racked.

Secondly, For timely Fining of Wines. All Wines in the Must are more opacous and cloudy. Good Wine soon fines, and the gross Lees settle quickly, and also the flying Lee in Time. When the grosser Lees are settled, they draw off the Wine; this is called Racking. The usual Times for Racking are *Midsummer* and *All-ballowtide*.

The Practice of the *Dutch* and *English* to rid the Wine of the flying Lees speedily, and which serves most for *French* and *Spanish* Wines, is thus performed.

Take of Isinglass half a Pound; steep it in half a Pint of the hardest *French* Wine that can be got, so that the Wine may fully cover it; let them stand twenty four Hours; then pull and beat the Isinglass to Pieces, and add more Wine; four Times a Day squeeze it to Jelly, and as it thickens add more Wine. When it is full, and perfectly jellied, take a Pint or Quart to a Hoghead, and so proportionably; then overdraw three or four Gallons of that Wine you intend to fine, which mix well with the laid Quantity of Jelly; then put this Mixture to the Piece of Wine, and beat it with a Staff, and fill it-top full.

Note, That *French* Wines must be bunged up very close; but not the *Spanish*; and that Isinglass raises the Lees to the Top of strong Wines, but, in weaker, precipitates them to the Bottom.

They mend the Colour of sound Clarets by adding thereto red Wine, Tent, or *Alicant*; or by an Infusion of Turnsole, made in two or three Gallons of Wine, and then putting it into the Vessel, to be then (being well stopped) rolled for a Quarter of an Hour.

This Infusion is sometimes twice or three Times repeated, according as more Colour is to be added to the Wine; about three Infusions of the Turnsole are sufficient; but then it must be rubbed and wringed.

Claret over-red is amended with the Addition of white Wines.

White Wines coming over sound, but brown, are thus remedied.

Take of Alabaster Powder, overdraw the Hoghead three or four Gallons, then put this Powder into the Bung, and stir and beat it with a Staff, and fill it Top-full. The more the Wine is stirred, the finer it will come upon the Lee, that is the finer it will be.

To colour Sack white: Take of white Starch two Pounds, of Milk two Gallons, boil them together two

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Hours; when cold, beat them well with a Handful of white Salt, and then put them into a clean, but sweet Butt, beating them with a Staff, and the Wine will be pure and white.

One Pound of the before mentioned Jelly of Isinglass takes away the Brownness of *French* and *Spanish* Wines, mixed with two or three Gallons of Wine; according as it is brown and strong, more or less to be used. Then overdraw the Piece of Wine about eight Gallons, and use the Rod; then fill the Vessel full, and in a Day or two it will be fine, and be white, and mend, if qually.

The first Buds of *Ribes nigra*, i. e. black Currants, infused in Wines, especially Rhenish, make it diuretick, and more fragrant in Smell and Taste, and so doth Clary.

The Inconvenience is, that the Wine becomes more heady: a Remedy for which is Elder Flowers added to the Clary, which also betters the Fragrancy thereof, as it is manifest in Elder Vinegar, but these Flowers are apt to make the Wine ropy.

To help brown *Malagas* and *Spanish* Wines: Take Powder of Orris Roots and Salt-petre, of each four Ounces, the Whites of eight Eggs, to which add as much Salt as will make a Brine; put this Mixture into Wine, and mix them with a Staff.

To meliorate muddy and tawny Clarets; Take of Rain Water two Pints, the Yolks of eight Eggs, Salt a Handful; beat them well, let them stand six Hours before you put them into the Cask, then use the Rod, and in three Days it will come to itself.

To amend the Taste and Smell of *Malaga* Wine: Take of the best Almonds four Pounds make an Emulsion of them with a sufficient Quantity of the Wine to be cured; then take the Whites and Yolks of twelve Eggs, beat them together with a Handful of Salt, put them into the Pipe, using the Rod.

To amend the Smell and Taste of *French* and *Rhenish* Wines, which are foul: Take one Pound of Honey, a Handful of Elder Flowers, an Ounce of Orris Powder, one Nutmeg, a few Cloves to an Aulin of the Wine, boil them in a sufficient Quantity of the Wine to be cured, to the Consumption of half, and when it is cold, strain it and use it with the Rod; some add a little Salt. If the Wine be sweet enough, add one Pound of the Spirits of Wine to a Hoghead, and give the Cask a strong Scent. Spirit of Wine makes any Wine brisk, and fines it without the former Mixture.

A Lee of the Ashes of Vine Branches, viz. a Quart to a Pipe, being beaten into Wine, cures the Ropiness of it, and so infallibly doth a Lee of oaken Ashes.

For *Spanish* ropy Wine: Rack it from the Lees into a new scented Cask, then take of Allum one Pound, of Orris Roots powdered half a Pound, beat them well into the Wine with a Staff; some add fine and well dried Sand, put warm to the Wine. If the Wine besides prove brown, add three Pottles of Milk to a Pipe: This cures ropy Wine, before it begins to fret.

To mend and preserve the Colour of Clarets: Take red Beet Roots, q. f. scrape them clean, and cut them into small Pieces; then boil them in q. f. of the same Wine, to the Consumption of the third Part; scum it well, and when cool, decant off what is clear, and use the Rod.

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Firing of Wines in *Germany* is thus performed: They have in some Vaults three or four Stoves, which they heat very hot; others make Fires almost before every Vat; by this Means the Must fermenteth with that Vehemency, that the Wine appears between the Staves, when this Ebullition, Fermentation, and Working cease, they let the Wine stand some Days, and then rack it. This Firing is only used in cold Years, when the Wine falls out green.

To set old Wine a fretting, being deadish, and dull of Taste: Take of Stum two Gallons to a Hoghead, put it hot upon the Wine, then set a Pan of Fire before the Hoghead, which will all ferment till the Sweetness of the Stum is communicated to the Wine, which thereby becomes brisk and pleasant.

Some use this Stuming at any Time; some in *August* only, when the Wine hath a Disposition to fret of itself, more or less Stum to be added, as the Wine requires.

The best Time to rack Wine is in the Decrease of the Moon, and when the Wine is free from fretting, the Wind being at North-east or North-west, and not at South, the Sky serene, free from Thunder and Lightning.

Having thus given an Account of the different Practices of the *Vignerons*, Vintners, and Wine Coopers, in the Management of their several Wines, I shall next offer a few Things which have occurred to me from some Observations and Experiments, relating to the making of Wines in *England*.

The Grapes, being ripe, should be cut when they are perfectly dry, and carried into a large dry Room, where they must be spread upon Wheat Straw, in such a Manner as not to lie upon each other; in this Place they may remain a Fortnight, three Weeks, or a Month, according as there is Convenience, observing to let them have Air every Day, that the Moisture perspired from the Grapes may be carried off. Then, having the Presses and other Things in good Order, you should proceed in the following Manner: First, all the Grapes should be pulled off the Bunches, and put into Tubs, being careful to throw away such as are mouldy, rotten or not ripe, which if mixed with the others, will spoil the Wine; and if the Stalks of the Bunches are pressed with the Grapes, there will be an austere Juice come from them, which will render the Wine acid and sharp; this, I fear, has spoiled a great Quantity of Wine which was made in *England*, which, if otherwise managed, might have proved very good; for we find in *France*, and other Wine Countries, where Persons are desirous of having good Wine, they always pick the Grapes from off the Stalks before they are pressed, though indeed the common *Vignerons*, who have more Regard to the Quantity than the Quality of their Wines, do not practise this. But as in *England* we labour under the Inclemency of Climate, we should omit nothing of Art which may be necessary to help the Want of Sun.

The Grapes, being thus carefully picked off, should be well pressed, and if it is designed for red Wine, the Husks and Stones should be put into the Liqueur, and if the Seeds or Stones of the Grapes are broken in the Press, the Wine will have more Strength, which must be put into a large Vat, where the Whole should ferment together

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together five or six Days; after which the Wine should be drawn off, and put into large Casks, leaving the Bung Hole open to give Vent to the Air which is generated by the Fermentation. But it must be remarked, that after the Wine is pressed out, and put into the Vat with the Husks, if it does not ferment in a Day or two at most, it will be proper to add a little Warmth to the Room by Fires, which will soon put it into Motion; and for Want of this it often happens, where People press their Wine, and leave it to ferment in open cold Places, that the Nights, being cold, check the Fermentation, and so cause the Wine to be foul, and almost ever after upon the Fret. This Husbandry is much practised upon the *Rhine*, where they always have Stoves placed in the Houses where the Wine is fermented, wherein they keep Fires every Night, if the Season is cold, while the Wines are fermenting.

If white Wine is desired, then the Husks of the Grapes should not remain in the Liquor above twelve Hours, which will be long enough to set it a fermenting; and when it is drawn off, and put into other Vessels, it should not remain there above two Days before it is drawn off again, and this must be repeated three or four Times, which will prevent its taking any Tincture from the Husks in fermenting.

When the greatest Fermentation is over, the Wine should be drawn off into fresh Casks, which must be filled to the Top, but the Bung Hole should be left open three Weeks, or a Month, to give Vent to the generated Air, and that the Scum may run over; and as the Wine subsides in the Casks, they should be carefully refilled with Wine of the same Sort from a Store Cask, which should be provided for that Purpose; but this must be done with much Care, lest, by hastily refilling the Casks, the Scum, which is naturally produced upon all new Wines should be broken thereby, which will mix with the Wine, and foul it, causing it to take an ill Taste; therefore it would be proper to have a Funnel, which should have a Plate at the small End, bored full of little Holes, that the Wine may pass through in small Drops, which will prevent its breaking the Scum.

After the Wine has remained in this State a Month or six Weeks, it will be necessary to stop up the Bung Hole, lest, by exposing it too much to the Air, the Wine should grow flat, and lose much of its Spirit and Strength; but it must not be quite stopped up, but rather should have a Pewter or Glass Tube, of about half an Inch Bore, and two Feet long, placed in the Middle of the Bung Hole. The Use of this Tube is to let the Air, which is generated by the Fermentation of the Wine, pass off, because this, being of a rancid Nature, would spoil the Wine, if it were pent up in the Cask, and in this Tube there may always remain some Wine, to keep the Cask full, as the Wine subsides; and, as it shall be necessary, the Wine in the Tube may be easily replenished. For want of rightly understanding this Affair, a great Quantity of the choicest Wines of *Italy*, and other Countries, have been lost. A great Complaint of this Misfortune I received from a very curious Gentleman in *Italy*, who says, Such is the Nature of this Country Wines in general (nor are the choicest *Chianti's* excepted), that at two Seasons of the

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Year, viz. the Beginning of June and September, the first when the Grapes are in flower, and in the other when they begin to ripen, some of the best Wines are apt to change, especially at the latter Season; not that they turn eager, but take a most unpleasant Taste, like that of a rotten Vine Leaf, which renders them not only unfit for Drinking, but also to make Vinegar of, and is called the *Settembrance*. And what is most strange is, that one Cask, drawn out of the same Vat, shall be infected, and another remain perfectly good, and yet both have been kept in the same Cellar.

As this Change happens not to Wines in Flasks (though that will turn eager), I am apt to attribute it to some Fault in refilling the Cask which must always be kept full, which either by letting alone too long, till the Decrease be too great, and the Scum there naturally is on all Wines, thereby being too much dilated, is subject to break, or else being broken by refilling the Cask, gives it that vile Taste. But against this there is a very strong Objection, i. e. That this Defect seizes the Wine only at a particular Season, viz. September; over which if it gets, it will keep good many Years, so the Case is worthy the Enquiry of Naturalists, since it is evident, that most Wines are more or less affected with this Distemper, during the first Year after making.

Upon receiving this Information from *Italy*, I consulted the Rev. Dr. Hales of *Teddington*, who was then making many Experiments on fermenting Liquors, and received from him the following curious Solution of the Cause of this Change in Wine, which I sent over to my Friend in *Italy*, who has tried the Experiment, and it has accordingly answered his Expectation, in preserving the Wine, which was thus managed, perfectly good. He has also communicated the Experiment to several *Vignerons* in several Parts of *Italy*, who are repeating the same, which take in Dr. Hales's Words:

From many Experiments which I made the last Summer, I find that all fermented Liquors generate Air in large Quantities, during the Time of their Fermentation; for, from an Experiment made on twelve cubick Inches of *Málaga Raisins*, put into eighteen cubick Inches of Water the Beginning of March, there were 41. cubick Inches of Air generated by the Middle of April; but afterwards, when the Fermentation was over, it resorbed a great Quantity of this Air; and from forty-two cubick Inches of Ale from the Tun (which had fermented thirty-four Hours before it was put into the Bolt-head) had generated 639 cubick Inches of Air; from the Beginning of March to the Middle of June; after which it resorbed thirty-two cubick Inches of Air; from whence it is plain, that fermented Liquors generate Air, during the Time of their Fermentation, but afterwards they are in an imbibing State, which may perhaps account for the Alteration of the nice *Italian Wines*; for Wine, during the first Year after making, continues fermenting more or less, during which Time a great Quantity of Air is generated, until the Cold in September puts a Stop to it, after which it is in an imbibing State. Now the Air thus generated is of a rancid Nature (as the *Grotto del Cano*), and will kill a living Animal, if put into it. So that if, during the Fermentation of the Wine, there are two Quarts of this rancid Air generated, which is closely pent up in the upper Part of the Vessel, when the Cold shall stop the Fermentation, the Wine by, absorbing this Air, becomes foul, and acquires

this rancid Taste; to prevent which, I would propose the following Experiment.



Suppose the Vessel A filled with Wine, in the Bung Hole of this Vessel B, I would have a Glass Tube of two Feet long, and about two Inches Bore, fixed with a Pewter Socket closely cemented, so as that there may be no Vacuities in the Sides, and into this Tube should be another, of about half an Inch Bore, closely fixed; the lower Tube should always be kept about half full of Water, up to X, which will supply the Vessel, as the Wine therein shall subside; so that there will be no Room left in the upper Part of the Vessel to contain any generated Air, which will pass off through the upper small Tube, which must be always left open for this Purpose; and the Tube being small, there will be no Danger of letting in too much Air to the Wine.

As the Wine in the lower Tube shall subside, it may be refilled by introducing a slender Funnel through the small Tube, down to the Scum upon the Surface of the Wine in the larger Tube, so as to prevent its being broken, by the Wine falling too violently upon it. This Experiment, being tried with Glass Tubes, will give an Opportunity to observe what Impression the different States of the Air have upon the Wine, by its rising or falling in the Tubes; and if it succeeds, it may be afterwards done by wooden or metal Tubes, which will not be in Danger of breaking.

This curious Experiment, having succeeded wherever it has yet been tried, will be of great Service in the Management of Wines, there being many useful Hints to be taken from it, particularly with Regard to fermenting Wines; for, since we find that Wines too long fermented (especially those which are produced in cool Countries) seldom keep well, so, by letting them stand in a cool Place, the Fermentation will be checked, which is agreeable to the Practice of the *Champagnoi*, who keep the Wines in Winter in Cellars above Ground; but when the Weather grows warmer in Spring, they then carry them down into their Vaults, where they are cooler than in the Cellars; and this Method of removing their Wines from the Cellars to the Vaults, and back again into the Cellars, as the Seasons of the Year shall require, is found of great Service in preserving the Wines in Perfection; for these Wines, being weak (when compared with those produced in more southern Countries) have not Body enough to maintain them, if they are permitted to ferment all the succeeding Summer, which the Heat of the Season will promote where the Wine is exposed to its Influence; and this surely must be worth the Trial by those who make Wine in this Country, since it is the Practice of the northern Countries, which is the most proper for our Imitation, and not that of the most southern.

But after the Wine has passed its Fermentation in the Vat, and is drawn off into the Casks, it will require something to feed upon; so that you should always preserve a few Bunches of the best Grapes, which may be hung up in a Room for that Purpose, until there be Occasion for them; when they should be picked off the Stalks, and two or three good Handfuls put into each Cask, according to their several Sizes; for want of this, many Times People make Use of other Things, which are by no means so proper for this Purpose.

The *Vignerons* of different Countries do also put various Sorts of Herbs into the Vat, when the Wine is fermenting, to give it different Flavours. Those of *Provence* make use of Sweet-marjoram, Balm, and other Sorts of aromatick Herbs; and upon the *Rhine* they always put some Handfuls of a peculiar Kind of Clary into the Vats, from whence arise the different Flavours we observe in Wines, which, it is possible, were made in the same Manner, and from the same Sorts of Grapes. How far this might be thought worth practising in *England*, a few Experiments would inform us; though it is to be questioned, whether these Herbs mend the Wine, because it seems to obtain amongst the *Vignerons*, purely to alter the Flavour of their Vines, in order to render them agreeable to the Palate of their particular Customers; but, however this be, it is yet certain, that there is some Art used to alter the Flavour of the Wine, in most of the different Wine Countries of *France*; for it is the same Sort of Grape, which the Curious always plant in *Orleans*, *Champagne*, and *Burgundy*; and how different these Wines are in their Flavour and Quality, every one who is acquainted with them, well knows; and this Difference can never be effected by the Situation of the Places; since there is no very great Difference in the Heat of these Countries; nor do I believe their different Ways of making their Wine can alter their Flavour so much, especially those of *Orleans*, and *Burgundy*, where there is little Difference in their Management; but in *Champagne* there is this Difference from the rest, that they always cut their Grapes in a Morning, before the Dew is gone off, or in cloudy Weather; whereas the *Vignerons* of all the other Places never cut any till they are perfectly dry; which may occasion a great Alteration in the Wine.

The Method commonly practised to give the red Colour to Wine, is to let it ferment a few Days upon the Skins, which they always observe to press two or three Times, in order to make them discharge their Contents; but where a deep-coloured rough Wine is desired, there they put a Quantity of a certain Sort of Grape, whose Juice is red, into each Vat; this is well known in *England* by the Name of Claret Grape; the Leaves of this Vine always change to a deep purple Colour as the Fruit ripens; and the Grapes are of a fine blue Colour, with a Flue over them like fine Plumbs; but the Juice of them is very austere, especially if they are not very ripe.

This red Wine will not require to be drawn off into Casks more than at first from the Vat; for it may remain in the same Vessel until it is fit to bottle off, which, I think, should not be done till the Wine is two Years old; the greater Quantity of Wine there is in each Vessel, the more Force it will have, and so consequently be in less Danger of suffering from the Injuries of Weather, especially if the before mentioned Method be practised; but where there are large Quantities of Wine preserved in close Vaults, People should be very cautious how they at first enter them, after they have been shut up for some Time; because the Air of this Vault will become rancid from the Mixture of the generated Air, proceeding from the Wines, which has often killed People who have incautiously entered them.

Of the Concentration of Wines, and other fermented Liquors, so as to reduce them in Bulk, render them more unalterable

unalterable and perfect, more durable, and fit for Service, Carriage, and Exportation; by Dr. Stahl; translated by Dr. Shaw.

Dr. Stahl treats this Subject to the Purpose following:

1. He observes, that Wines, and all fermented Liquors, both before and after Fermentation, consist not of similar Parts, but heterogeneous ones, connected together in one certain determinate Order. Thus the Action and Essence of Fermentation being a Separation and Destruction of the former Connexion of the Subject, and transposing its Parts anew; there must of Necessity have been a Kind of free and durable Texture in the Subject so disjoined, separated and new ranged.

2. For Example; Grapes, being laid upon dry Straw in a cold Place, will, for some time after they are separated from the Vine, preserve that Texture which gives them their saline, unctuous, and slimy Sweetness, which the Juice also retains after pressing, and becomes a clear transparent Must, without separating itself into the heterogeneous Parts; but continuing uniformly and evenly mixed, so as to preserve the different Matters it consists of, intimately collected among themselves. And in this firmly connected State it may be kept for many Months, if a Cask be perfectly filled therewith, and let in a cold Place, as is evidently seen in Stum.

3. Wine, in the precise, chemical, or philosophical Notion thereof, is a saline, clammy, oleaginous Matter, diluted with a large Proportion of Water; whereby it is set at a Distance from itself, or expanded; whilst the saline Parts are saturated with and interspersed among, the subtile earthy ones, that make the Sliminess; and then together they imbibe, detain, entangle, and hold the grosser oily Parts; besides which, there are other oily Parts, vastly more subtile, that, by means of the highly attenuated Portion adhering to them, remain as much connected with the Water, as the rest; and these are what we call the spirituous Parts; but the Connection of them all together is so strong and durable, that they move for a long Time as one Body, without separating, if carefully preserved.

4. But if the spirituous Part be once drawn away, and separated from the Wine by distillation, though it were immediately poured back, or restored to the remaining Mass from whence it came, and ever so finely shaken in again therewith, the whole by no means recovers its former Taste, Odour, and Durability, but turns to a confused turbid Mixture of a different nauseous Taste, unnatural Smell, and approaches near to a Vapidity.

5. Again; if an inflammable Spirit, distilled from the same, or any other Kind of Wine, be put to a Parcel of Wine that was too saline, or not sufficiently spirituous, the bare Addition, or tumultuary Admixture thereof, very far from giving the fine and intimate Softness of a good Wine, will rather manifest its own burning Acrimony, and inodorous Flavour, to the Smell and Taste; and also add a nauseous Bitterness to the former Tartness and Austerity.

6. So likewise any considerable Heat, or even a Degree of Simmering or Tepidity, will, by its intestine and subtile Agitation, that barely disturbs the exceeding fine spirituous Parts, which are very susceptible

of the Motion of Heat, or disjoins them from the rest, occasioning an Alteration of its Taste, Transparency, and Durability, as much as if the Spirit had really been drawn off, and poured back again.

7. On the other Hand, Wine kept in a cool Vault, and well secured from the external Air, will preserve its Texture entire in all the constituent Parts, and be sufficiently strong for many Years; as appears not only from old Wines, but other foreign fermented Liquors, particularly those of *China*, prepared from a Decoction of Rice; which, being well closed down, and buried deep under Ground, continue for a long Series of Years rich, strong, and generous, as the Histories of that Country universally assure us.

8. The like is also to be understood of Vinegar, after it has thrown off the superabundant earthy Parts; and many of the oily ones that presided while it continued Wine; whence the saline ones now get the Ascendant, and, as it were, subdue and preside over the spirituous; for good and perfect Vinegar, being well stopped down, will continue pure and unaltered for a great Length of Time.

9. But if it be left open, so that its fine Vapour exhales, or its more subtile Part be drawn off from it, and again poured back; in either Case it loses its uniform Consistence, and particularly its Durability, and now directly hurries into Vapidity and Corruption.

10. If, either by Fraud or Accident, a larger Proportion of Water comes to be mixed with Wine, than is absolutely proper for its Consistence, and no way necessary or essential; this superfluous Water does not only deprave the Taste, and spoil the Excellence, of the Wine, but also renders it less durable; for Humidity in general, and much more a superfluous aqueous Humidity, is the primary and restless Instrument of all the Changes by Fermentation.

11. It may therefore, doubtless, be useful, and sometimes very convenient, to take away this superfluous Water from the other Part, which strictly and properly constitutes the Wine; but for the Method that this may commodiously be done, he first examines those proposed by others for that Purpose, and shews the Difficulties and Insufficiencies, and afterwards proposes an easy way of effecting the Thing.

The Method of condensing Wines by Heat or Evaporation.

1. It will be found, by any Person who shall make the Experiment, that all fermented Liquors labour with an Over-proportion of Water; and that, if a very considerable Quantity of it were taken away, they would become not only more rich, but also more durable; provided so much Humidity were still retained as is just necessary to preserve the vinous Consistence, keep the saline Part fluid, and the slimy and unctuous Parts mixed in, and expanded along, with the rest.

2. But as an actual and truly saline Matter abounds in Wine and Vinegar, and that of an acid, austere, or tartareous Kind, when the spirituous Part is drawn away, the Wine becomes surprisingly more austere; and when a large Quantity of the watery Part is separated, this superabundant, saline, tartareous Matter coagulates into a chrysaline Form, and falls to the Bottom, or strikes to the sides of the Cask; for the subtile oily Matter,

which makes the spirituous Part in Wine, blunts, and takes off from a tartareous Acidity, in the same Manner as the Addition of rectified Spirits of Wine blunts, sheaths, and dulcifies, the corrosive and acid Spirits of Nitre, Salt and Vitrol.

3. But this tartareous Salt also abounding with an Over-proportion of a gross unctuous Manner, cannot be dissolved or diluted without a very large Proportion of Water; which being taken away, it presently concretes into dry solid Chrystals; as is the known Case of *Cremor Tartar*.

And hence proceeds the Effect before observed, viz. that the Acidity and Roughness of the Wine manifests themselves the more, when the Wine is deprived of its Spirits.

And this is an Experiment familiar in the Kitchen, when Wine is burnt or used in Sauce; for boiling always gives it a much greater Degree of Austerity.

4. And when this Water is, even by Distillation, plentifully drawn off from Wine, not of a terrestrial and chalky, but of a tartareous Nature, a beautiful Tartar will be found to crystallize among the remaining Mass, and destroying those Properties thereof, which ought to be preserved.

5. For, first, the spirituous Part is the Life of the Wine, and all fermented Liquors; and not only keeps them together, embalms the whole, and renders it durable, or not subject to Corruption; but also, in great Measure, gives them that aromatick, refreshing, and restorative Virtue and Effect they have upon the human Body.

6. This inevitably proves the Case, whenever Wine is evaporated or distilled, which constantly requires a Degree of Heat sufficient to convert Water into Vapour; whence the spirituous Part, being much more volatile than the aqueous, flies off together with, or even before it, and thus leaves the Wine dissolved in its Texture, and without its Soul.

Upon which the remaining saline, slimy, unctuous Mass is so disturbed, as no longer to remain connected, but immediately turns thick and turbid, and afterwards runs impetuously into a Kind of Corruption, attended with Vapidity and Ropiness.

All which Circumstances abundantly shew the Method of Exhalation to be absolutely unfit for condensing Wines, as it so many ways destroys the whole vinous Texture and Compages.

Of the Method of condensing Wines by Percolation.

1. That Wine, strictly and properly so called, is of a grosser and thicker Body than Water, or that the essential and truly constituent Parts of Wine may be considered as separate and distinct from a superfluous and copious Aquosity, appears *a priori* and *a posteriori*.

2. For, first, it is rational to conceive, that a Matter consisting of a Collection of saline, slimy, and unctuous Parts, brought into one Mass, should have a grosser Consistence than pure and simple Water.

3. And next, this Grossness of the proper and essential Particles of Wine manifests itself to the Eye.

1. in those Diseases of Wine, wherein they become viscous and ropy, when they not only lose their Transparency, but may be drawn out and extended like a Mu-

cus; and do not, upon pouring out, then fall in Drops, but run down in long ropy Strings.

2. It appears again to the Eye, in Vinegar grown mothery, mucilaginous, and tough, so as sometimes to afford a dense Skin like Leather; which cannot well be supposed to proceed from the Water, but from the more proper and essential Parts of the Wine it was made of.

3. But because these Inspissations may possibly be attributed to some supernatural Disorder of the Wine, we may add, that our Method of concentration exhibits this Grossness of Parts to the Eye; whilst the Wine remains in a perfect State, free from its superfluous Aquosity; for here it appears much denser, and deeper in Colour; less fluid, less thin, less transparent, and in every Respect of a thicker and higher Consistence.

4. Lastly, This is still more evident in Malt Liquors, which being concentrated in our Manner, taste full and thick, almost like Oil in the Mouth, and pour out like that, or a thin Syrup; being at the same Time also heightened or concentrated in Colour.

From the preceding Phenomena it should seem natural, that these different Parts of Wine, which vary so much in Consistence and Tenuity of Matter, might be separated from each other by a commodious Percolation: so that the aqueous Parts, which appear the finest, should run through the Pores of a proper Strainer, and leave the grosser behind.

But the Practice hereof is clogged with great Difficulties: for,

First, those thin Liquors, which have a manifest and copious Saltiness, as Wine has, are either so attenuated and their gross Part, however thick in Comparison of Water, is yet so subtle penetrating itself, as at the same Time to pass the Pores of any ordinary Strainer: at least, such Liquors will, along with their aqueous, transmit the finest and most delicate of their Parts, and leave the more sluggish, the truly grosser, or those most tending to Ropiness, behind.

It must also be observed, that most Kinds of Wine besides their genuine, substantial, rich, and essential Part, have constantly joined with them some foreign, superfluous, and prevailing gummy or mucilaginous Matter; which the more it inviscates the nobler Part, the thicker and grosser it actually becomes; whilst the other finer Portion, which is not clogged with such a Load, remains more penetrating and active.

And hence also the Difficulty of condensing Wines by Percolation is increased, as this subtle spirituous Part passes the Strainer along with the Water.

A contrary Difficulty attends the Use of a close Strainer, arising from the gross mucilaginous Particles, either accidentally interspersed in the Wine, or cleaving to this and other fermented Liquors, but especially Malt Drinks; for these viscous, tenacious, and clammy Particles presently clog and stop the Pores of the Strainer, and by that Means hinder the thinner and more watery Particles from getting away; and the natural Tenacity or Clamminess of Liquors prepared from Malt, Honey, and the like, communicates in the Manner of a Mucilage, such a Ropiness, even to the superfluous Water, and diffuses and expands itself so much therein, that the Water itself is thereby thickened, and rendered much less apt to flow.

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A third Difficulty attends this Method by Percolation; viz. that although it were possible to make the Separation, yet the Work would proceed so slow, that the more subtle, fine, brisk, volatile, and spirituous Parts, which give the pungent Taste and Odour, might, in the mean Time exhale, and leave the remaining Wine flat and vapid; or, if this Inconvenience could be prevented, yet, in so tedious an Operation, some prejudicial, fermentative Operation would, in all Probability, happen.

And, after all, there would still remain a Question, as to the Matter to be used in the Strainer; which they who have never made any Experiment that way, might little dream of.

For, as the common Filtres or Strainers are generally made of Paper, Linen, or some Kind of Cloth; all these readily communicate and impress a foreign disagreeable Taste to the Liquor, especially to Wine if intended for Condensation in this Manner.

And it may seem surprising, that even a momentaneous Passage of condensed Wine through the cleanest Linen, will give it a remarkable and very disagreeable Taste of the Bag, that shall continue for many Months.

This happens in a much greater Degree to condensed Wine, after the same Manner as the highest rectified Spirit or Alcohol of Wine will, in many Cases, perform a Solution, immensely quicker, and more powerful than such a phlegmy Spirit, though mixed but with a tenth Proportion of Water; for so our concentrated, or, as we may call it, our rectified Wine, being freed from its superfluous Phlegm, has a more powerful, more immediate, and more intimate Effect upon the Parts of the Cloth, and other Bodies, by means of the Concentration of its spirituous and saline Parts, than when its Efficacy is weakened by being diluted with Water.

This Method, however, by Percolation, though no way sufficient to free the Wine of all its superfluous Water, may yet be of some Service, if applied with due Regard to the Difference there is between fermented Liquor, especially in Point of Consistence; and therefore some faint or imperfect Imitation of our Method may be had by means of such Paper Filtres, or other common Strainers.

And, in this View, that common Tavern Trick, with a Piece of Lint, when dexterously performed, might be of some Service; for if a long thick woollen String be first soaked in Water, and then one End of it plunged into Wine, whilst the other End hangs a great Way down without the Glass, it will, in an imperfect Manner, draw away the Water from the Wine.

But all these, and the like Attempts, are trifling and useless, in comparison of our easy, expeditious, and perfect Manner of effecting the Thing: to which we next proceed.

Of the Method of condensing Wines, and other Saline spirituous Liquors, by Cold.

Having shewn above, what Effect the Motion of Heat, and the Action of Fire, have upon all fermented Liquors, and especially upon the finer Parts of them, and more directly upon those of Wine; and how much they contribute to dissolve the intimate Union of vinous Fluids, and change their whole Nature, which consists in that Union, and Connection; we pass on to the Con-

sideration of Cold, which being opposite to Heat, may be supposed to have different Effects; or at least such as better suit the present Purpose.

If any Kind of Wine, but rather such as has never been adulterated, be in a considerable Quantity, as that of a Gallon or more, exposed to a sufficient Degree of Cold in frosty Weather, or in any Place where the Ice continues all the Year, and so be brought to freeze; the superfluous Water contained in the Wine will be turned to Ice, and leave the proper, and truly essential Part unfrozen, unless the Degree of Cold should be very intense, or the Wine but weak and poor.

When the Frost is moderate, the Experiment has no Difficulty; because, in that Case, not above a third or fourth Part of the superfluous Water will be frozen in a whole Night; but if the Cold be very intense, the best way is, at the End of a few Hours, when a tolerable Quantity is formed, to pour out the remaining Liquor, and expose it to freeze afresh by itself. And

1. Because, when the Quantity of Ice grows large, more of the concentrated Wine will be apt to hang and lodge in it.

2. Because it would otherwise require a longer Time to drain away from the Ice.

If the Vessel that thus by Degrees receives the several Parcels of condensed Wine, be suffered to stand in the cold freezing Place where the Operation is performed, the Quantity lying thin, in pouring out, or otherwise, will be very apt to freeze anew; and if be set in a warm Place, some of this aqueous Part thaws again, and so weakens the rest.

The condensed Wine therefore should be emptied in some Place of a moderate Temper, as to Cold and Heat; where neither the Ice may dissolve, nor the vinous Substance mixed among it be congealable. But the best Experiment of all is, to perform the Operation with a large Quantity of Wine, as that of several Gallons, where the utmost Exactness or Prevention of all Waste need not be so much regarded.

By this Method, there freezes about one Third of the whole Liquor, and is properly the more pure aqueous Part thereof; inasmuch that when all the vinous Fluid is poured off, to be exposed to a farther Concentration, the Ice remaining behind, upon this first emptying, being set to thaw gently in a warm Place, dissolves into a perfectly aqueous Fluid, retaining only a light Scent, but extremely little of the Taste and Colour of the Wine.

If the Wine, now once concentrated, should, by longer Continuance in the freezing Cold, be again congealed to the utmost (unless the Cold were very severe) and then again be drained from the Ice, there soon after falls to the Bottom of the Glass it is poured into, a gross white and shining Powder of Tartar; and even the icy Part, remaining behind, deposits a little more of this Powder, after thawing, and again, the same vinous concentrated Matter does the same upon standing a few Days or Hours; but the more of it, as the Wine was austere or genuine, neat, and unadulterated with Sugar, Brandy, or the like.

The Ice of the second Operation differs in no Respect from that of the first, provided the vinous Matter be perfectly drained away from it, before the Ice is set to melt;

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melt; whereby it runs into the same Kind of Phlegm, excepting only when the Wine was less spirituous, that it tastes a little more saline than the Water separated by the first Operation.

The Part which has escaped being frozen in both Operations, is a real concentrated Wine, as appears by its Colour, Consistence, Taste, and Smell; for it has now all those Properties in a greater Degree, and a much narrower Space, than when so largely diluted with superfluous Water; and therefore becomes a much nobler and richer Wine, than without such a Contrivance could possibly be procured; for as by this Means two third Parts of Phlegm are taken away, in the better Sort of Wine, or three Fourths in the weaker, what remains must needs become highly rich and saturate.

This Operation, though it be perfect in Wine, does not succeed altogether so well in rich Malt Liquors.

Thus, for Example: Having by several Concentrations reduced a full Gallon of strong Malt Liquor to the Quantity of a Pint and Half; the Ice separated from it in the first Concentration, resolved into a Liquor somewhat of the Colour and Taste of small Beer, and that obtained at last, might have almost passed for small Beer, though a flashy watry Taste manifestly predominated in it; but the Part that remained uncongealed was extremely rich, and for consistence and Taste, far exceeded the famous double *Brunswick* Mum.

In point of Strength or Spirituosity it seemed perfectly aromack, and nobly flavoured; a Thing not found in common Malt Liquors; and for Consistence, it resembled a dilute Syrup, and with a pleasing Softness, sheathed the Acrimony of the Spirit, and concealed the Bitterness of the Hop, which before was very considerable.

The mucilaginous Nature, predominant in all Malt Liquors, here occasions a greater Inaccuracy, as not suffering the condensed Part to get clear and run from the Ice; but as this Liquor is cheaper than Wine, the Loss is less considerable; and not only so, but if the Operation were to be performed in large, the thawed Liquor might be commodiously employed in a fresh Brewing; so that, with a slight Enchiresis, all Manner of Loss may be prevented.

And thus likewise the Phlegm of Wine separated in the Operation, may, by a proper Ferment, be converted into good Vinegar, with a great deal of Ease, and a moderate Profit.

What a large Quantity of Water abounds in Vinegar, is well known to those that are skilled in Chemistry; so that a great Quantity of Vinegar will saturate but a small one of alkaline Salt; and again, a deal of Vinegar is required to dissolve a little Quantity of Metal.

A Pint of the strongest Vinegar will scarce dissolve above two Drams of Iron; or saturate more than the like Quantity of good Salt of Tartar; but our Method of Condensation effectually remedies this Inconvenience; and so far deprives the Vinegar of its superfluous Water, and collects its acetous penetrating Sharpness, as to render it extremely powerful; thus throwing out five or six Parts of useless Phlegm, that tastes scarce perceptibly acid, and, at the same Time, retaining the Strength and Virtue of the whole, in the Part remaining uncongealed.

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The Advantages of the Method of condensing Wines by Cold.

It is certain, that the best and noblest Wines, if exposed for several Days to the warm open Air, of the Summer, out of a Vault, or other proper Receptacle, will inevitably corrupt and spoil, throwing a mouldy and mucilaginous Matter to their Surface, and acquiring a Degree of Stench or Vapidity, or, at best, turning to Vinegar. On the contrary, the Wine condensed in our Manner suffers none of these Changes, upon being so exposed; but remains for a long Time not only uncorrupted, but even unaltered, as we have experienced for many Years.

And as this Difference is owing to nothing more than freeing the Wine of its superfluous Water; it may hence be fairly presumed, that Water alone is the principal or immediate Instrument of all the fermentative Motions and Changes of vinous Liquors.

We condensed, in our Method, a Gallon and a Half of poor, weak, austere, and acid Wine, to about a Quart, in the Winter of the Year 1696, and put it into a Glass Bottle, whereof a third Part remained empty, and stopped it only with a hard Wreath of Paper; and thus it stood for the Space of two Years in my Bed-chamber, where, during the Summer, when the Weather was fair, the Windows were open all Day long; and were also, in the Winter, other aqueous Liquors froze. During this Time, it was often opened, and some of it poured out, both to taste, and otherwise to use; and yet all this Time it neither grew mouldy nor sour, nor suffered any Separation of Parts; only deposited a small Quantity of Tartar, but retained its original Consistence and Taste entire; except some small Change in both for the better.

In the same Manner we concentrated a somewhat better Kind of Wine to a little more than a fourth Part; but the Bulk of this did not keep so well as the former, as having many more Tasters, than the austere and disagreeable Sort.

When it was by Degrees tasted away to half a Pint, I put the Remainder into a Glass, and tied it over with a Piece of Bladder; then set it in the same Place, near the former; but could not prevent its being sipped away by Degrees, till only about three Ounces were left.

This small Quantity stood all the Summer, barely covered with a loose Bladder, without Alteration, or growing in the least mouldy or acid, and long after retained its most grateful Taste, and quick Smell; only the latter was somewhat weakened through the Bottle's remaining untied down; and that under this Inconvenience it should continue so perfect and entire is surprising.

I had in the Winter of the Year before, condensed a very small Quantity of the same Sort of Wine to half an Ounce, and put it into an Ounce Phial, which remained lightly tied down all the next Year in my ordinary Stove Room, where it kept without corrupting, till after the End of the Winter; when by the unequal, and sometimes violent Heating of the Room, it became vapid and mouldy.

A Parcel of Vinegar concentrated after the same Manner in the Winter 1694, and by that Means brought to

to a corrosive Degree of Sharpness, which rendered it unfit for the Table, stood in the same Room with the concentrated Wines, for three whole Summers and Winters, without any Manner of Tendency to Corruption, or the smallest Sign either of Mouldiness or Ropiness.

These Examples and Experiments sufficiently show, that Liquors thus concentrated, may, for a long Time, be kept in a State of Perfection with little Care.

But there are some particular Changes of Wines and Vinegars, thus concentrated, that happen in Process of Time.

1. Wines, upon being thus concentrated, seem to acquire a more austere Taste, than they had originally; and no Wonder, as the Concentration brings their saline and rough Matter into a Third or Fourth of its original Compacts; so that this is no new Addition or increase of the rough Taste, but perhaps some Degree of Mitigation thereof, in regard of the Closeness whereto this rough Matter is brought; which, of itself, ought rather to multiply the Effect in a greater Proportion.

The Change may be conceived owing to this, that all Wines are observed to grow mild and soft by long lying; which Effect is greatly promoted in them by a successive Separation of their Tartar, and a gentle Evaporation of some Part of their Water; occasioning that Necessity we find of frequently filling up the Casks in the Summer Months; but in our concentrated Wine, though some Tartar be successively separated, yet there is found no concurrent Evaporation; for the concentrated Wine grows soft and mellow in a well-stopped Glass, where no sensible Diminution of the Quantity is perceived.

But the Effect proceeds principally upon a closer Combination of the grosser with the spirituous Part; which, now wanting Water, successively throws off the grosser Tartar from the rest of the Mixture.

But besides this, there seems to be another remarkable Change incident to our concentrated Wines, not only in the Taste, but abundantly in the Smell; for although that very austere Wine above-mentioned had a much milder Taste the third Year than the second, yet its specifick Odour perfectly resembles that of Sack or Canary, so as to be mistaken for it, from the Smell alone, by good Judges, who were acquainted with the original Flavour of the Wine, from whence it was concentrated.

Nor is this Change of Odour peculiar to wine alone; but concentrated Vinegar participates somewhat of it, and was observed for some Time to lose it, in great Measure, upon being left long stopped only with Paper, and the Bottle often poured out.

And therefore as it is plain, that Wines, and all other fermented Liquors, become much more durable by Concentration; and yet this Durability is here confirmed and proved from small and inconsiderable Quantities, wherein they always retain their Goodness; it is obvious, that if the Operation were performed in large, a great Bulk of the Liquor thus concentrated would be still immensely less subject to Alteration from the Air and Heat; which are the two great Incentives to fermentative Motion; and that if such small Parcels suffered no Change for the worse, much less would the larger.

But as these concentrated Liquors, by reason of their considerable Proportion of saline and fine spirituous Parts, have a less Tendency to Dissolution and Corruption; so, on the contrary, the aqueous Part, separated from them, has a very strong Tendency thereto; for as it takes from the Wine, and carries off with it a little of the mucilaginous and unctuous Part, and yet is almost wholly a mere moveable fluid Water, that is the most active Instrument of fermentative Motion, it cannot but presently fall into Corruption.

This Business of Congelation is not only applicable to immediate Profit, but also paves the Way to certain Matters of Curiosity, and shews one Particular, which, though not new, but antiently common and familiar, has yet grown strangely into Disuse through the Indolence of Mankind.

As to the Point of immediate Use, it needs no Explanation; for he must be very dull indeed, who does not immediately perceive, that Wines, &c. by this Method, may be reduced to any Degree of Vinosity, Strength, or Perfection.

Thus, for Example: If a Wine of a moderate Strength have a third Part of its Water taken away, in the Form of Ice, by Congelation, the remaining Part will thereby be doubled in Strength and Goodness; for if in the better Sorts of Wine we allow, as we may, one third Part to be good, or truly vinous, and two third Parts to be Water; then that one third good Part is divided among the two aqueous Parts; whence if one of the two aqueous Parts be taken away, that same third Part, before divided between the two Waters, now remains collected or condensed, in a double Proportion, along with but one of them.

But if this Concentration be carried up to the utmost, and practised in a large Quantity, with a somewhat intense Cold, it may perhaps reduce good Wines to a Sixth; and this small Quantity might commodiously be used as a Quintessence, to meliorate, improve, and even specificate, smaller and low flavoured Wines.

To conclude; as to the direct and immediate Use of our Method of Concentration, he who has the Secret, by means of a little, dry, powdery Body, of turning Water into Wine, will not, perhaps, easily divulge the capital Use he may make of the Experiment.

WINE PRESSES. [*A Description of the great Taisson or Framed Press.*] The Press, which is a Machine, or moving Power, contrived to squeeze the Juice out of Grapes, consists of an Assemblage of many Pieces of Timber, placed after different Dispositions, which compose three Bodies of Timber-work, closely joined to the Axis, which serves as a Swing, whereby it may be moved by the Vice.

The great Presses are thirty or thirty-three Feet long, and twelve or sixteen wide. To make one of these Machines, they first dig a Pit in the Ground about four Feet deep, and sixteen Feet square, in the most commodious Place where the Press is designed. In the Middle of this Hollow, they build a small Pile of Masonry the whole Length, for a Foundation, two Feet thick, and three Feet high, in such a Manner, as to have only one Foot below the Surface of the Ground; then they made a parallel Wall, to surround the Press from the Right to the Left, to the Extremity of the Pit, at

an equal Distance from the Pile in the Middle, for supporting some of the Timbers, and to prevent the Earth from falling down into the Pit. The Space between these three little Walls of three Feet Depth, is necessary to give Air to the Wood, to prevent its rotting.

The Wall, which ought to be from the Sides of the Beams (which may be placed from the Right to the Left of the Press, according to the greatest Conveniency of the Place), should be deeper than the Hollow of the Beams, which shall be explained hereafter; and that which is contrived on the bent Side of the Beams, should be thicker than the Squares of the Bason; which will be more easily comprehended by what follows.

Upon the little Wall of the Middle, they lay a Piece of Timber Lengthwise, which they call a false Stilling; upon this, to the Side of the hollow Beams, they place a Ground Plate, which is supported by another Pile of Masonry, which is joined close to the Beams, and the Piles which they cross; all these Pieces should be laid level, in order to support four Stillings, which are placed across them at an equal Distance. These Pieces ought to extend beyond the Wall of the Bason, on the Side of the Beams, about three Feet, and be laid upon the Piles, to hinder them from rising; there must always be allowed a Declivity of three or four Inches from the Front to the four Stillings, in order to facilitate the Draining of the Wine into the Cask, which should be placed under the Middle, in the fore Part of the Bason, to receive it from the Side where the Holes are bored.

They afterwards place upon these four Stillings, cross the Bason of the Press, some Pieces of Wood called Maye; these should have their Tops level with the Top of the Stillings, and ought to be cut in Notches of four Inches in Length on both Sides the Bason, for receiving the Maye in such a Manner, that they may be fastened on each Side with Wedges, after having put in the Middle of the Joints Potters-Earth and Moss, to prevent the Wine from getting out at the Crevices; these Pieces of Maye are simply joined together without Fillets or Notches, that they may the better close the two Ends to the Middle of the Quoins their whole Length, between the Stillings and the Side of the last Pieces of Maye; these Pieces should be raised in the Middle with a Ridge, to make a gutter in each Joint, to facilitate the Draining of the Wine; they also make, for the same Purpose, a Ridge or Furrow all round the Extremity of the Pieces of Maye.

In the Place appointed for the Beams, on the Right or Left of the Bason, they make a Hole big enough to erect a Frame of Masonry twelve Feet deep, eight long, and five broad. One of the three Piles of Masonry, which supports the Bason, serves there instead of one Side of the Wall to the Beams, which are driven into the Ground at the Bottom of the said Frame, twelve Feet deep, and are fifteen or sixteen Feet above the Level of the Ground; these they join with the Piles which cross them, upon which they put the Beams, which are all joined by Cramps of Wood, except the last, to which the Stillings serve instead of Braces. They afterwards erect the Masonry, in which they inclose the Ends of the Piles, as also those of the Braces to prevent the Beams from rising; these Piles ought to

be placed contrary to the Stillings, which surround or cross them every three Feet, and dovetailed into the square Supporters; the Space left between the Masonry they do not fill up, that the Beames may be preserved from rotting, and that, if Occasion be, they may go down into the Pit. The Beams ought to be laid in such a Manner, that their Sides may occupy the Middle of the Bason, and they should incline two Inches beyond it; the Front and Sides must be made smooth and even, but the Back and Tops must be left rough; they make a-top, under the Pieces of Maye, a Ledge of two or three Inches, for Support to the Carriage; the Top of the Beams is joined with a cross Beam, under which is a Spindle supported by a diagonal Beam, on which all the Force and resistance of the Press bears; this diagonal Beam should be closely fastened with Nails and Girders under the Heads of the Beams. In the Middle of the other Side of the Bason, they put upon the Ground Plate, between the Ends of the Stillings, two false Beams a little Distance from the true ones, because it is on this Side that the Axel-tree is notched to receive the Beams, to prevent their recoiling back; these are a little enlarged towards the false Beams; they sustain these with four cross Pieces, or strong Jambs, two on the Front, and two on the Sides, which abut against them, and keep them in their Places; these cross Pieces are borne by the Ground Plate and the Posts, and let in at the other End, just to the Middle of the false Beams; these ought to be bored about four Feet high, that the moving Pins may be put in there for the Beam to rest upon; these false Beams should have Holes at the Bottoms, to receive the wooded Pegs, which cross the Ground Plate, and are cut to half their Thickness, that they may be capable to enter the Notches, and be joined with Keys and Pins where they cross the false Beams; they likewise bind these Beams at the Top with a cross Beam, and they sustain them again at the Bottom with two cross Pieces on their Sides; these cross Pieces are placed upon the Posts, which are joined into the Ground Plate by a Dove-tail, and are borne up horizontally by a small Piece of Masonry of their own Size, which is chiefly hid in the Ground; there must also be on each Side a large cross Piece to cross the Bason, which binds together the false Beams with the true, both before and behind; these they fasten to the Top of the Beams, allowing them a Foot and a Half Declivity to the Place where they are mortised into the false Beams.

They also make in the Ground, on the Sides of the false Beams, ten Feet from the Bason, a Pit twelve Feet deep, and ten Feet square, to place the two Blocks, which should join at Bottom, and be separated by the great Ends, about two Feet above the Surface of the Ground, in such a Manner, that the Screw may be able to play between them; these must be joined at Bottom to the Piles by a strong Dove-tail, and the Piles joined with Braces; and near the Top, about fifteen Inches from the Head, they should be bound with Girders and Pins, to keep them asunder, and prevent their parting. The Space between the Blocks and the Piles must be filled up with Earth, which should be well rammed; these Girders should be let in seven or eight Inches to the Body of the Blocks.

In the Middle of the Girders there should be a Hole

to put in the Screw, which should there descend perpendicularly, and which is rounded to this Place, and lessened to a third Part of its Thickness; and a Foot lower than the Girders ought to be a Rail placed as a Support, from Bottom to Top, in a Slope, for a Rest to the Screw; there should be on this Rail a Plate of Iron, and an Axis to the Screw, for its Play; the Screw must be twelve Feet long, and thirteen Inches thick at the Top; the Screw-tap, or the Extremity of the spiral Line, ought to be three Inches and a Half, and should form an exact Square; the Screw should pass cross a Wheel, which is placed three Feet from the Surface of the Ground, and which in this Place should be square, and about an Inch and a Half of its Thickness pared off for the Play of the Wheel; this Wheel should be joined with Spokes and Curb, athwart, into which they put divers Pegs, that they may be able, with five or six Men, to give it the necessary Motion.

Lastly: There should be placed, at five Feet from the Bottom of the Bason, two great Beams; which must pass between the true and the false Beams; these must be both squared or pared away at the great End, on both Sides where the Beams touch, where they let them into a Notch, to prevent their coming out; and at the back Part they put a Key, to secure them from being displaced (for they cannot put them into it); but nevertheless, in such a Manner, that they may play between the Beams, without changing their Position; these Beams should be well fitted to their Bed, and joined with Keys, that they cannot part from each other; for they should open insensibly from the false Beams, where they ought also to separate to the Right of the Screw, to give Place for it. Upon the End of these Beams must be joined the Nut of the Press with moveable Keys, that by this Means it may be raised or lowered, so that the Beams may rise and fall as a Kind of Swing, which has the Keys for its Center, which are the false Beams, where the great Beams rest, and the Bag, which is upon the Bason. When they press, before the Pressman raises the Beam, by Means of the Screw, they lower it on the Sides of the false Beams a little, that they may force the Quoins between the Beams and the Spurs, which is upon the false Beams, then they lower it with the same Screw from the Side of the false Beams. After they have moulded the Grapes with the three Poles, the Planks, and the Nave, by the Help of the Wheel which moves the Screw, they press the Bag strongly.

These Beams should be two Feet and a Half thick; and if that is not big enough, they put two upon each other, and sometimes three, if it be necessary; these they join together with Nails in different Places, both on the Bed, and in the Front, that they may work together, as if there were but two; and they raise at the End of the Press, on the Side of the false Beams, a small hanging Scaffold or Steps to go up to Strike the Quoins.

Of the great Framed Press.

This Sort of Press is made like the other except that, instead of Blocks, they use a Frame. They make a great Pit in the Earth twelve Feet deep, and nine Feet Diameter; and, to support the Earth, they build a Wall of Stone all round it, in the Form of a Well,

which ought to be seven Feet Diameter, that they may place in this Space a Frame of Wood Work of a square Figure, joined together with Posts, Joists, Ground Plates, and Rafter, like a St. Andrew's Cross. In this Frame they put a solid Stone of about three thousand Weight; then they join the Screw to the Center of the Frame, that they may be turned together, and so keep the Beams upon the Stock of the Wheel, to press the Grapes, in such a Manner as if one Man was suspended at one End of a Pole, which is made fast at the other, and in the Middle there is something to press. At about two or three Feet from the Ground is a Wheel, by Means of which, and the Weight of the Frame, they make the Screw descend, which lowers the Beam. The Frame should be ten Feet high, and four Feet nine Inches square on each Front. Great Care should be taken of the Block Presses, not to screw them too hard, lest it break the Beams, and split them to pieces, nothing being of greater Force than a Screw. You must not fail to make the Dovetails very exact, but, above all, the Screw and the Nut should be made artificially to their Work.

These great Presses make, at one Vat or Stowage, from twenty to twenty-five Pieces of Wine. One may make it less by a fourth Part, and it will press as well, when there are not above ten or fifteen Pieces of Wine. In this Case the Pieces should be proportionably diminished in the Bigness from what has been described.

The Names, Length, and Thickness, of the Pieces which compose a great Press.

The main Beams from thirty-two to thirty-five Feet long, and, one with another, from two Feet and a Half to three Feet thick.

The Cheeks or Side Beams twenty-eight Feet long, about two Feet thick at the Bottom, and eighteen Inches at the Top.

The Piles twelve Feet long, and twelve or thirteen Inches thick. It must be observed to make these with counter Dovetails to those of the Cheeks; the first is placed at fifteen Inches from the Bottom of the Cheeks; one ought to put three from the Top, to that which is in the Ground and the latter should be even with the Top of the false Still.

Upon the Piles of the Cheeks, and upon those of the Blocks, are placed Braces of Wood nine Feet long, and about nine or ten Inches thick, to bind them together.

The Stillers six Feet long, and about fifteen or sixteen Inches square.

The Ground Plate eighteen Feet long, about eighteen Inches broad, and fifteen Inches thick.

The false Beams fourteen or fifteen Feet long, about thirteen or fourteen Inches broad, nine Inches thick at the Bottom, and six at the Top; these ought to be planed to the Size of the Keys, to support the main Beam.

The cross Piece of the False Beams six Feet long, four Inches broad, and nine or ten thick.

The Keys of the Beams, to the Direction of the Worm, five feet and a Half long, eight Inches thick towards the Head, but reduced to half the Size in the remaining Length.

W I N

The Pegs of the Keys fourteen Inches long, about five broad, and at least one and a Half thick.

The two cross Timbers of the false Beams about eight Feet long, four or five Inches thick, and the same Breadth of the false Beams.

The two other cross Timbers of the false Beams nine Feet long, and about eight Inches thick.

The Posts six Feet long, and about eight or nine Inches thick.

The Pieces of Maye, which are at the Bason, twelve Feet long, about nine or ten Inches broad, and six thick.

The great cross Timbers, put as a Band between the false Beams, six or seven Inches thick.

The two Blocks fourteen Feet long each; about sixteen Inches thick at the Head, and twelve at the Bottom.

The Screw fifteen Inches at the Bottom before it is squared, thirteen Inches, according to the Foot of the Screw which forms the spiral Line, and twelve Feet long.

The Wheel ten Feet Diameter, with Spokes of four Inches Thickness, the same as the Ribs, upon which are wooden Pegs for four or five Inches high, and one Diameter, admitting eight or nine Men in the Circumference of the Wheel.

The Nut of the Press six Feet long, two Feet broad, and fourteen Inches thick, which ought to be crested with Iron.

W I N

The cross Piece of the Cheeks six Feet long, about a Foot thick, and of the same Breadth as the Top of the Cheeks.

The Spurs, which are placed under the Spindle, between the two Cheeks, should be of the same Breadth as the Cheeks, and thirteen or fourteen Inches thick.

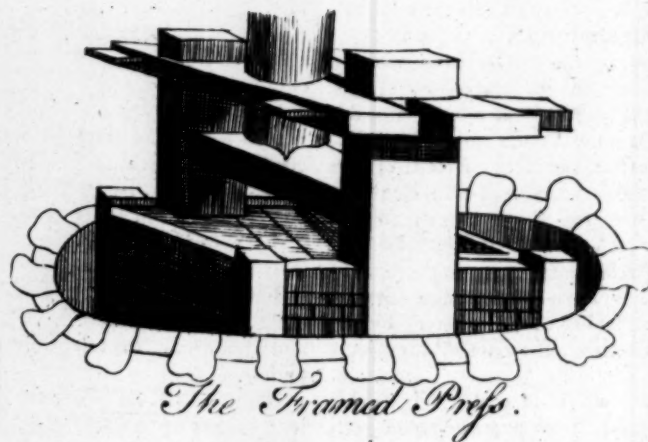
The Girders, which ought to embrace the Top of the Cheeks, must be two Inches higher than the under Part of the Spurs, one Foot broad, and about five Inches thick.

The Spindle two Feet high, and twelve or fourteen Inches thick; this is placed between the Spurs and the cross Piece, and crosses the Cheeks and the Spindle with a Key, which ought to be worked very exact, for there it is the whole Force of the Press resides.

The Quoins two Feet long, about nine or ten Inches broad, and six or seven thick.

The Frame in the framed Press, ten Feet long or deep, and four Feet nine Inches square, with four Fronts. The Nave, eight Feet and a Half long, about five Inches thick one Way, and six the other.

All these Timbers should be Oak, except the Screw, which should be Elm, which will last longer, and the Spindle should be of Walnut. One may make the most Part of these Timbers longer or shorter, according to the Size of the Wood made use of.



The Description of a slight Press.

This Sort of Press is much less chargeable than the others, and it also presses a much less Quantity of Wine, but it is nevertheless of great Use for private Persons, who have no great Vintage, where this will be sufficient, for it will make eight or ten Pieces of Wine at each Tunning.

The Construction of this slight Press is much the same with that of the other Presses, but I shall explain wherein they differ.

The

The Pit which is made in the Earth ought to be four Feet deep, fourteen broad, and eighteen long, more or less, according to the Size of the intended Press. They make three little Walls of Free-stone cross the Press, which occupies the Bottom of the Square of the Bafon; they make the Walls in the Middle two Feet, and those on the Sides two and a Half thick. An Opening must be left in the Middle of each of the Side Walls, about twenty Inches square, to place the two Cheeks one opposite to the other on each Side of the Bafon, which should incline an Inch and a Half towards the Bafon; these must be squared and planed on three Sides, from the Top of the Stillings, but the Top should remain rough. In these Sides, which are towards the Bafon, they make a Notch at the Height of two Feet and a Half from the Bafon, three Inches broad, four Inches deep, and two Feet high in ascending towards the Head.

They place the false Stillings upon the middle Wall; and upon each of the other they place two Piles, which embrace the Cheeks, and are joined to them by square Supporters and Dovetails. In crossing the Piles and the false Stillings, they put the four Stillings in Notches, as in the other Presses; those of the Middle embrace the Cheeks, and are joined to them as the Piles are, and should extend beyond the Piles, which are behind the Cheeks eight or nine Inches. The Top of the Stillings ought to be notched an Inch and a Half, fit to receive the Piles to keep the Whole together; then they put upon these the Pieces of Maye, which they close, as hath been already said, and the Bafon is the same with the other Presses.

The Spindle of the Screw ought to be seven or eight Inches longer than the Back of the Cheeks, and embrace them in their thickest Parts; this is placed upon them, and supported upon the Keys, which cross the Cheeks, by Nails; this must be stayed behind the Cheeks with a Key, and in Front with four Iron Bars, making a Square of a Foot and a Half, bored at the four Corners with Pins and Nails four or five Inches long towards the Screw-tap. Upon the Spindle they lay Planks of the same Length, which they cross in such a Manner, that their Ends are turned towards the Front of the Press; upon these Planks they lay two cross Pieces of the same Length as the Spindle, which embrace the Top of the Cheeks under their Heads; they let them in at each End in Front, where they are joined. These cross Pieces and the Cheeks ought to be nailed together, and they must put four cross Timbers, which should take hold of the Head of the Beams, and reach half the Length of the Head Pieces, for a Support to each.

They afterwards make a Screw with the same Instrument as that of the other Press, with a Square at Bottom, to join it to a Wheel, which should be laid horizontally well consolidated with the Screw, and joined with Ribs and Spokes a Foot wide crosswise; these Spokes ought to project out of the Ribs three or four Inches of half their Width, to be able to contain the Rope, which must be round the Wheel. Under the Center of the Wheel they place a Standard of the Length of the Space between the Cheeks, and eight Inches thick, or more, to make a Sort of Tenon at each End,

which goes into the Notch of the Cheeks. The Standard should be sustained by an Iron Pin, which goes in at the End of the Screw, to be held suspended by it, in such a Manner, that it may wobble. In order to this, the End of the Pin, which is under the Standard, should play with the Key which holds it at the other End of the Screw.

At ten or twelve Feet from the Press they place a Wheel, either horizontally or perpendicularly, with an Axel-tree, which ought to play in the Fliers of Wood, well fixed; they bind to the Wheel, which is at the Top of the Bafon, to one of the Spokes, or one of the Pins which is driven in for this Purpose, the Eilet Hole of a great Rope two Inches and a Half Diameter. They can turn the Wheel once or twice round with the Hand, before they take hold of the Rope, which ought to go round the Wheel five or six Times, and be fastened at the other End to that which is at the Side of the Press. They employ seven or eight Men to turn this Wheel. It is of great Consequence to observe, that when there is no more than one Turn and a Half of the Rope about the Wheel, and if there is another Bag to press, they should remit two or three Turns of the Rope to the Wheel to finish the Pressing, otherwise they would risque the breaking the Wheel at the Bottom, and laming the Pressers. When the Bag is sufficiently pressed, they stop the perpendicular Wheel for half an Hour, to allow Time for the Wine to drain off. In this Sort of Press, there is nothing but the Standard Presses. There ought to be one experienced Man, to whom the others ought to be obedient, to conduct the Pressing, and to cut and chop the Marc as often as it shall need.

The particular Pieces of a slight Press.

The two Cheeks, sixteen Feet long, and about eighteen or twenty Inches thick.

The Spindle, fifteen or sixteen Feet long, and about three wide.

The Head Piece, sixteen Feet long, and about thirteen or fourteen Inches thick.

The cross Timbers, six Feet long, and about six or seven Inches thick.

The Piles, twelve Feet long, and about twelve or thirteen Inches thick.

The Screw, seven or eight Feet long, about thirteen Inches thick to the spiral Line, and sixteen Inches at the Bottom, fitted to a Square; this should be notched in that Place two Inches, for placing the Wheel.

The Standard twelve Feet and a Half long, seventeen or eighteen Inches broad in the Middle, and ten at the Ends, and eight or ten Inches thick in the Middle, reduced to six or seven at the Ends.

The middle Wheel, nine Feet Diameter, and ten or eleven Inches thick.

The perpendicular Wheel of an equal Diameter, and five or six Inches thick in every Part of the Timber.

The Axel-tree ten or eleven Feet long, and eight Inches Diameter.

The false Stillings, and the Pieces of Maye, ought to be the same as in the other Presses in every Part.

The Stillings, eighteen Feet long, and the same Breadth and Thickness as in the other Presses.

The Nave, as in the other Presses; that is to say, seven or eight Feet long, and five or six Inches square.

This Description of the different Sorts of Presses which are used in *Champaign*, together with the annexed Plates, will, it is hoped, be sufficient to instruct a Workman how to erect either of the Sorts here exhibited.

WOODS and Groves are the greatest Ornaments to a Country Seat; therefore every Seat is greatly defective without them; Wood and Water being absolutely necessary to render a Place agreeable and pleasant. Where there are Woods already grown to a large Size, so situated as to be taken into the Garden or Park, or so nearly adjoining, that an easy Communication may be made from the Garden to the Wood; they may be so contrived by cutting winding Walks through them, as to render them the most delightful and pleasant Parts of a Seat (especially in the Heat of Summer,) when those Walks afford a goodly Shade from the scorching Heat of the Sun.

As I have already treated of the Use and Beauty of Wildernesses, and have given Directions for making and planting them; I shall not enlarge much upon that Head in this Place; therefore I shall only give some short Instructions, for cutting and making these Wood Walks in those Places where Persons are so happy as to have any grown Woods, so situated as to be near the Habitation, and are either taken into the Garden, or Walks made from the House or Garden, leading to them; as also how to plant and decorate the Sides of these Walks with Shrubs and Flowers, so as to render them agreeable and pleasant; and then I shall more fully treat of the Method to raise and improve Woods, so as to be of the greatest Advantage to the Possessor, and a publick Benefit to the Nation.

Where Persons have the Convenience of grown Woods near their Habitation, so that there may be an easy Communication from one to the other, there will be little Occasion for Wildernesses in the Garden; since the natural Woods may be so contrived, as to render them much pleasanter than any new Plantation can possibly arrive to within the Compass of 20 Years, where the Trees make the greatest Progress in their Growth; and in such Places where their Growth is slow, there cannot be expected Shade equal to the grown Woods, in double that Number of Years; but there is not only the Pleasure of enjoying a present Shade from these Woods, but also a great Expence saved in the planting Wildernesses; which, if they are large, and the Trees to be purchased, will amount to no small Sum.

If the Wood is so situated, that the Garden may be contrived between the House and that, then the Walk into the Wood should be made as near to the House as possible, that there may not be too much open Space to walk through in order to get into the Shade; if the Wood is of small Extent, then there will be a Necessity for twisting the Walks pretty much, so as to make as much Walking as the Compass of Ground will admit; but there should be Care taken not to bring the Turns so near each other, that the two Walks may be exposed to each other, for want of a sufficient Thickness of Wood

between; but where the Wood is large, the Twists of the Walks should not approach nearer to each other than 50 or 60 Feet; or in very large Woods they should be at a greater Distance; because, when the under Wood is cut down, which will be absolutely necessary every tenth or twelfth Year, according to its Growth, then the Walks will be quite open, until the under Wood grows up again, unless a Border of Shrubs, intermixed with some Ever-greens, is planted by the Sides of the Walks; which is what I would recommend, as this will greatly add to the Pleasure of these Walks.

These Wood Walks should not be less than 8 or 9 Feet broad in small Woods; but in large ones 15 Feet will not be too much, and on each Side of the Walks. The Border of Shrubs and Ever-greens may be 9 or 10 Feet broad; which may be so managed, as to shut out the View from one Part of the Walk to the other, at those Times when the under Wood is cut down; at which Times there will be an absolute Occasion for such Plantations; and at all Times they will afford great Pleasure, by adding to the Variety, as also by their fragrant Odour. The particular Sorts of Shrubs which will thrive in the Shade of Woods, as also the Flowers proper to plant near these Walks, are mentioned in separate Lists, at the End of this Work; so I shall not insert them in this Place.

The former Method which was practised in cutting these Walks through Woods, was to have them as strait as possible; so that there was much Trouble to make Sightings through the Woods, for Direction how to cut them; but where this was practised, every Tree which stood in the Line, good and bad, were cut down; and many Times boggy or bad Ground was taken into the Walks; so that an Expence of Draining and Levelling was necessary to render them proper for walking on; besides this, there were many other Inconveniencies attending these strait Cuts through Woods, as, first, by letting in a great Draught of Air, which in windy Weather renders the Walks unpleasant; and these Cuts will also appear at a great Distance from the Woods, which will have a very bad Effect; therefore the modern Practice of twisting the Walks through Woods, is to be preferred. In cutting these Walks, there should be particular Care taken to lead them over the smoothest and soundest Part of the Ground; as also to avoid cutting down the good Trees; so that whenever these stand in the Way, it will be better to lead the Walk on one Side, than to have the Tree stand in the Middle; for although some Persons may contend for the Beauty of such Trees which are left standing in Walks; yet it must be allowed, that unless the Walk is made much broader in those Places than in the other, the Trees will occasion Obstructions to the Walkers, especially when two or three Persons are walking together; so that it will be much better to have the Walks entirely clear from Trees; and where any large-spreading Tree stands near the Walk, to cut away the small Wood, so as to make an Opening round the Trees, where there may be some Seats placed, for Persons to rest under the Shade. The Turns made in these Walks should be as easy and natural as possible; nor should there be too many of them, for that will render the Walking through them disagreeable; therefore the great Skill

in making of these Walks is, to make the Turns so easy as not to appear like a Work of Art, nor to extend them so far to great Length, that Persons who may be walking at a great Distance, may be exposed to the Sight of each other; both these Extremes should be avoided as much as possible, since they are equally disagreeable to Persons of true Taste. When a Wood is properly managed in this Way, and a few Places properly left like an open Grove, where there are some large Trees so situated as to form them, there can be no greater Ornament to a fine Seat, than such a Wood.

We shall now treat of the Culture of Woods for Profit to the Possessor, and for the publick Benefit of the Nation.

The great Destruction of the Woods and Forrests which has been of late Years made in this Country, should alarm every Person who wishes well to it; since there is nothing which seems more fatally to threaten a Weakening, if not a Dissolution, of the Strength of this once famous and flourishing Nation, than the notorious Decay of its Timber; and as this Devastation has spread through every Part of the Country, unless some Expedient be seriously and speedily resolved on, to put a stop to this Destruction of the Timber, and also for the future Increase of it, one of the most glorious Bulwarks of this Nation will, in a few Years, be wanting to it.

And as there are small Hopes of this being remedied by those intrusted with the Care of the publick Woods, since their private Interest is so much advanced by destroying the Timber, which they were appointed to preserve: unless private persons can be prevailed on to improve their Estates, by encouraging the Growth of Timber, it is greatly to be feared, that in an Age there will be a Want of it for the Supply of the Navy; which, whenever it happens, must put a Period to the Trade of this Country.

It has been often urged, by Persons whose Judgement in other Affairs might be depended on, that the great Plantations, which, for several Years past, have been carried on in several Parts of this Kingdom, will be of publick Benefit, by the Propagation of Timber; but in this they are greatly mistaken; for in most of the Plantations which have been made for Years past, there has been little Regard had to the Propagation of Timber; present Shade and Shelter have been principally considered; and in order to obtain these soon, great Numbers of Trees have been taken out of Woods, Hedge Rows, &c. which, if they had remained in their first Situation, might have afforded good Timber; but by being transplanted large, are absolutely rendered unfit for any Use but Fuel; so that the great Quantity of Plantations which have been made, I fear, will rather prejudice than be of Use to, the Improvement of Timber; nor is there any other Method of increasing the useful Timber of this Country, than by sowing the Seeds in the Places where they are to remain; or in such Situations, where there are Plenty of Oaks in the Neighbourhood, if the Ground is properly fenced, to keep out Cattle and Vermin, the Acorns which drop from those Trees will soon produce Plenty of young Trees; which, if properly taken care of, will soon grow to Woods.

The two most substantial Timbers of this Country,

are the Oak and Chestnut; though the latter has been of late Years almost entirely destroyed in *England*; so that there are scarce any Remains of Trees of Size in the Woods at present; but there can be no Doubt of this Tree having been one of the most common Trees of this Country, as may be proved by the Old Buildings in most Parts of *England*; in which the greatest Part of the Timber is Chestnut. But as I have already treated largely of the Method of propagating both these Trees for Profit, under their respective Titles, I shall not repeat it here. Next to these, the Elm is esteemed as a profitable Timber; but of these there are few cultivated in Woods, especially in the South Part of *England*, where they chiefly grow in Hedge Rows, or Plantations near Houses; but in the North-west Part of *England*, there are Numbers of very large Trees of the Witch Elm growing in Parks, and some in Woods, as if that Tree was a Native of this Country, which has been much doubted; though as this Tree propagates itself by Seeds, it may be deemed an indigenous Plant in *England*.

The Beech is another Tree common in the Woods, especially on the chalky Hills of *Buckinghamshire*, *Kent*, *Suffex*, and *Hampshire*, where there are some very large Woods, entirely of this Sort; some of which have been of long standing, as appears by the Age of the Trees; but whether this Tree is a Native of this Country, has been a Point often disputed.

The Ash is a very profitable Tree, and of quick Growth; so that in less than an Age, the Trees will arrive to a large Size from the Seeds; therefore a Person may hope to reap the Profits of his Labour, who sows the Seeds; but this is not a beautiful Tree to stand near a Habitation, being late in the Spring in putting out its Leaves, and the first that sheds them in Autumn; nor is it a friendly Tree to whatever grows near it, the Roots drawing away all the Nourishment of the Ground; whereby the Trees or Plants which grow near are deprived of it; so that where the Ash Tree grows in Hedge Rows, the Hedges in a few Years are entirely destroyed; and if they are in Pasture Grounds, and the Cows browse on them, the Butter made with their Milk, will be bad; for which Reason the Ash should be sown separate in Lands, which are inclosed, where Cattle are not permitted to come, and at a Distance from the Habitation.

Upon sandy or rocky Soils, the *Scotch Pine* will thrive exceedingly, and turn to great Advantage to the Planter, provided the Plants are planted young, and treated in the Manner directed in the Article *Pinus*, to which the Reader is desired to turn to avoid Repetition.

There are also several aquatick Trees, which are very profitable to those who have low marshy Lands, where the harder Kinds of Timber will not thrive; these are the Poplars of several Sorts, the Willow, Alder, &c. but as these, and all the other Kinds of Trees, have been fully treated of, both as to their Propagation and Uses, and also an Account of the different Soils in which each will thrive best, under their respective Titles; the Reader is referred to them for farther Information; and I shall next treat of the general Management

ment of Woods, of whatever Kinds of Trees they are composed.

Where there are young Woods, great Care must be taken of the Fences; for if Cattle should get in among the Trees, they will, in a short Time, do infinite Damage to them, by browsing on the Branches, or barking the Trees; and during the first ten Years of their Growth, they should be secured from Hares and Rabbits; otherwise, in severe Frost, or when the Ground is covered with Snow, whereby they are deprived of other Food, they will get into the Woods, and eat off the Bark from the young Trees, and gnaw all the Branches within their Reach; so that in a few Days, where there are Plenty of these Animals, there may be such Destruction made among the young Trees, as cannot be retrieved, but by cutting them down to the Ground; which will be a Loss of two or three Years; therefore those Persons who have the Care of young Woods, should be very diligent in frosty Weathers, in looking over the Trees, and stopping the Holes in the Fences, to keep out all Vermin.

Another Care to be taken of young Woods, is the thinning the Trees from Time to Time, as they increase in their Growth; but in doing this, there must be great Caution used; for it should be gradually performed, so as not to open the Trees too much, to let the cold Air among them; which will greatly retard their Growth; nor should the Trees be left so close, as to draw each other up like May-poles, but rather observe a Medium in this Work, cutting down a few each Year, according as there may be Necessity for it, being careful not to permit those to stand which may spoil the Growth of the neighbouring Trees, always observing to leave those Trees which are the most promising.

The young Trees in these Woods should not be lopped or pruned; for the more they are cut, the less they will increase in Bulk; every Branch which is cut off, will rob the Tree of its Nourishment, in Proportion to the Size of the Branch; therefore the Hatchet should not be suffered to come into young Woods, unless in the Hands of skilful Persons.

Where Persons have more Regard to the future Welfare of the Timber, than their immediate Profit, the under Wood should be grubbed up, as the Trees advance, that the Roots may have the whole Benefit of the Soil, and their Stems enjoy the free Air; without which, their Stems are generally covered with Moss; and their Growth greatly stunted; as may be observed in all such Woods, where there is any Quantity of under Wood remaining; in which Places it is rarely found, that the Trees do ever grow to a large Size; therefore where large Timber is desired, the Trees must have Room to extend their Roots and Branches, without which it cannot be expected; but from a covetous Temper, many People let their under Wood remain as long as it will live; for as the Timber increases, the under Wood will be gradually decaying, by the Shape and Drip of the large Trees; so that by this Method the Timber suffers more in a few Years, than the Value of the under Wood; therefore, by endeavouring to have both, neither of them can be so good, as where they are separately preserved.

If Persons who have Estates would be careful to nurse up Trees in their Hedge Rows, it would in Time become a Fortune to their Successors; as hereby the Timber growing in the Hedges may be worth more than the Freehold of the Estate, which has often been the Case with Estates, from which their Possessors have cut down Timber for Fortunes for their younger Children; the Frequency of this should encourage Persons to be a little more attentive to the Growth and Preservation of young Woods; since the Expence and Trouble is not great, and the future Profit very certain; besides, the Pleasure of seeing Trees of a Man's own sowing make yearly Advances, must be very great to those who have any Relish for Country Amusements.

There are several Persons who plant Copse for cutting every 10 or 12 Years, according to their Growth. These are usually planted in Autumn, either with Stools or young Plants, which are drawn out of the Woods; the latter should always be preferred to the former. These Copses are commonly planted with several Sorts of Trees, as Oak, Beech, Chestnut, Ash, Birch, Willow, &c.; but the Ash and Chestnut are the most profitable, where they grow kindly; because the Poles of Ash are very valuable; these also are good for Hoops; so that there is no Danger of wanting Sale for these Copse Woods when they are fit for cutting; but where the Copses are intended to remain, there should be no Standard Trees left for Timber; because as the Heads of the Trees spread, and overtop the under Wood, it will cause that to decay; and where the Standards are left on the Stumps of the Copse Wood, they will never grow to a large Size; nor will the Timber be so valuable as that produced immediately from a young Root; therefore whoever will make the Experiment, will be convinced, that it is more for the Advantage of both, to keep them in distinct Woods.

But where Persons plant Copses on Land free from Trees, it will be the better Method to sow the Seeds, especially if Chestnut, Oak or Beech, are the Trees intended; for although it is a prevailing Opinion with the Generality of Persons, that by planting they save Time, yet I am sure of the contrary; for if the seedling Plants are kept clear from Weeds, they will in 8 or 10 Years out-grow those which are planted; and these unremoved Copses will continue much longer in Vigour than the other; so that for either Timber or Copse Wood, the best Method is to prepare the Ground well, and secure the Fences, and sow the Seeds; which is so far from losing, that in 20 Years it will be found to gain Time; which is what every Planter wishes to do.

The usual Time of felling Timber is from November to February: at which Time the Sap in the Trees is hardened; for when the Sap is flowing in the Trees, if they are cut down, the Worm will take the Timber, and cause it to decay very soon; therefore if the Durableness of the Timber is considered, the Trees should always be cut in the Winter Months; but as the Bark of the Oak is so valuable for tanning Leather, there has been a Law passed, to oblige Persons to cut these Trees during the Spring Season, when the Bark will readily peel off; by which the Timber is rendered unfit for building either Ships or Houses, as it will be very

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very subject to cast, rift, or twine, and the Worm will soon take it; therefore it would be more for the publick Benefit, if a Law were enacted to oblige every Person to strip off the Bark of such Trees, as

are designed to be cut down in the Spring leaving the Trees with their Branches standing till the following Winter; which will be found to answer both Purposes well.

X.

XANTHIUM. *Tourn. Inst. R. H.* 438. Tab. 252. *Lin. Gen. Pl.* 937. Lesser Burdock.

The Characters are,

It hath male and female Flowers on the same Plant. The male Flowers have a common scaly Empalement; they are composed of several tubulous Funnel-shaped Florets, which are equal, and disposed in a Hemisphere; they are cut into 5 Segments at the Top, and have each 5 very small Stamina, terminated by erect parallel Summits. The female Flowers are situated under the male by Pairs; they have no Petals, or Stamina, but they are succeeded by oblong, oval, prickly Fruit, having 2 Cells, each including 1 oblong Seed, convex on one Side, and plain on the other.

The Species are,

1. *XANTHIUM caule inermi, aculeis fructibus erectis.* Lesser Burdock with an unarmed Stalk, and the Spines of the Fruit erect. *Xanthium sive lappa minor.* *J. B.* 3. 572. *Xanthium* or lesser Burdock.

2. *XANTHIUM caule inermi, aculeis fructibus incurvis.* Lesser Burdock with an unarmed Stalk, and incurved Spines to the Fruit. *Xanthium Canadense majus, fructu aculeis aduncis munita.* *Tourn. Inst. R. H.* 439. Greater Canada Burdock, bearing a Fruit armed with crooked Spines.

3. *XANTHIUM spinis ternatis.* *Hort. Ups.* 283. Lesser Burdock, having triple Spines. *Xanthium Lusitanicum spinosum.* *Par. Bat.* Prickly Portugal lesser Burdock.

4. *XANTHIUM caule inermi, aculeis fructibus, longissimis erectis simplicibus.* Lesser Burdock with an unarmed Stalk, and very long erect Spines to the Fruit which are single.

The 1st Sort grows naturally in Europe, and also in India, from whence I have received the Seeds; it has been found growing wild in a few Places in England, but of late Years it has not been seen in those Places. I did once see it growing in the Road near Dulwich College. The Stalk of this Plant is round, and has many black Spots; it rises in good Ground, 2 Feet high, sending out a few side Branches. The Leaves stand on slender Foot Stalks, which are near 4 Inches long. From the Wings of the Stalks arise the Foot Stalks of the Flowers. The Leaves are almost Heart-shaped, but some of the larger are cut on their Sides into 3 acute Lobes; they are irregularly indented on their Edges, end in acute Points, and are of a pale green on their under Side, but of a dark green on their upper. The Flowers are produced in loose Spikes, the male Flowers growing at the Top, and the female Flowers under them; they are of an herbaceous Colour, and are collected into roundish Heads. The female Flowers are succeeded by oblong oval Fruit, closely armed with short erect Spines. This Plant flowers in July, and the Seeds ripen in Autumn.

This Plant has been much esteemed by some Physicians, for the Cure of scrophulous Tumours, and also in Leprosies, but is rarely now used.

The 2d Sort grows naturally in North America. The Stalks of this are much thicker, and rise higher than those of the first; the Leaves are not hollowed at their Base, nor are they divided so deeply on their Sides, as those of the first; they are unequally indented on their Edges, and have 3 strong longitudinal Veins, but are of the same Colour with the former. The Flowers are produced in shorter and looser Spikes. The Fruit are much larger, and are armed with stronger Spines which are incurved. This flowers in August, and in warm Seasons the Fruit will ripen in Autumn.

The 3d Sort grows naturally in Portugal and Spain. The Stalks of this rise 3 Feet high, and send out many Branches the whole Length; these are garnished with oblong Leaves which are indented on their Edges, and end in acute Points; they are from 2 to 3 Inches long, and three Quarters of an Inch broad, of a dark green on their upper Side, but hoary on their under, having very short Foot Stalks. The Flowers come out from the Side of the Branches, 2 or 3 at each Place, one of which is female, and is succeeded by oblong oval Fruit armed with slender sharp Spines which are erect. The Stalks and Branches are armed with long, stiff, triple Thorns on every Side, which renders it dangerous to handle them. This flowers in July and August, and the Seeds ripen in Autumn.

The 4th Sort was discovered by the late Dr. Houfouni, in the Year 1730, growing naturally at La Vera Cruz; this Plant rarely grows more than 6 or 7 Inches high. The Leaves are small, and shaped like those of the second Sort; the Flowers are produced in loose Spikes at the Top of the Stalks; the Fruit is as large as those of the second Sort, but the Spines are slender, single, and strait. This flowers about the same Time with the third Sort, but, unless the Autumn proves warm, the Seeds will not ripen in England.

All these Plants are annual. The first will come up from the Seeds which fall in Autumn, and requires no other Care but to thin the Plants where they are too close, and keep them clear from Weeds; the second Sort formerly was as easily cultivated, and came up from the self-sown Seeds as readily, and rarely failed to ripen its Seeds, but of late Years the Autumn has proved so bad, that the Seeds have not come to Maturity.

The 3d Sort will perfect its Seeds some Years on self-sown Plants, but, as they sometimes fail, the sure Way is to raise the Plants on a gentle hot Bed, and after they have obtained Strength, plant them on a warm Border on a lean Soil, which will stint the Plants in their Growth, and cause them to be more fruitful for when they

they are planted in rich Ground, the Plants will grow to a large Size, and will not produce Flowers till late in Autumn, so the Seeds will not ripen.

The 4th Sort must be raised on a hot Bed in the Spring, and the Plants should be transplanted each into a small Pot, and plunged into a fresh hot Bed, to bring them forward. After they have obtained Strength, they should be inured to the free Air gradually, and in June some of the Plants may be turned out of the Pots, preserving the Ball of Earth to their Roots, and planted in a South Border, where, if the Season proves favourable, they will perfect their Seeds.

All these Plants delight to grow in a rich moist Soil.

XANTHOXYLUM. *Lin. Gen. Pl. 335.* The Tooth-ach Tree.

The Characters are,

The Flower has no Empalement, but has 5 oval Petals, and 5 slender Stamina, longer than the Petals, terminated by furrowed Summits; it has 3 Germina which are united at their Base, having each a lateral Style crowned by obtuse Stigmas. The Germina afterward become so many Capsules, each containing 1 roundish, hard, shining Seed.

The Species are,

1. **XANTHOXYLUM foliis pinnatis, foliolis lanceolatis serratis petiolatis.** Tooth-ach Tree with winged Leaves having Spear-shaped sawed Lobes growing on Foot Stalks. *Xanthoxylon spinosum, lentisci longioribus foliis, eonymi fructu capsulari.* *Catesb. Carolin. 1. p. 26.* Prickly Tooth-ach Tree with longer Mallich-Tree Leaves, and Capsules to the Fruit like that of the Spindle Tree.

2. **XANTHOXYLUM foliis pinnatis, foliolis oblongo-ovatis integerrimis sessilibus.** Tooth-ach Tree with winged Leaves having oblong, oval, entire Lobes without Foot Stalks, commonly called broad leaved Tooth-ache Tree.

The 1st Sort grows naturally in South Carolina, where it rises 15 or 16 Feet high. The Stem is woody, and about a Foot thick, covered with a whitish rough Bark, and armed with short thick Spines; these grow to a large Size as the Trunk increases in Bulk, so as to become Protuberances terminating in Spines. The Leaves are sometimes placed by Pairs, and at others they stand without Order; they are composed of 3, 4, or 5 Pair of Spear-shaped Lobes placed opposite, terminated by an odd one; they are of a deep green on their upper Side, and of a yellowish green below, a little sawed on their Edges, and stand on short Foot Stalks. At the End of the Branches come forth the Foot Stalks which sustain the Flowers; these branch out, and form a loose Panicle. The Flowers are composed of 5 white Petals, which are small, and having no Cover, they are by some called the Empalement; but being of a different Colour from the Leaves, I shall take the Liberty to stile them Petals. Within these are situated 5 Stamina which are terminated by reddish Summits, and in the hermaphrodite Flowers there are 3 Styles fastened to the Side of the Ovarium. After the Flower is past, the Germen turns to a roundish four-cornered Capsule, each containing 1 roundish, hard, shining Seed. It is sometimes called Pellitory Tree.

This has been generally confounded with the prickly yellow Wood or yellow *Hercules* of Sir Hans Sloane, but is very different from that; for in the *West-Indies* it is one of their largest Timber Trees, and the Specimens, which I have received from *Jamaica*, are very different from those of *Carolina*. The Leaves of the former are twice as large as those of the latter; the Lobes of the Leaves are almost 3 Inches long, and an Inch and a Half broad; they sit close to the Foot Stalk, and the Leaves are equally winged, having no single Lobe at the End. The Flowers of this I have not seen, but the Capsules have 5 Cells, each containing 1 black, shining, hard Seed.

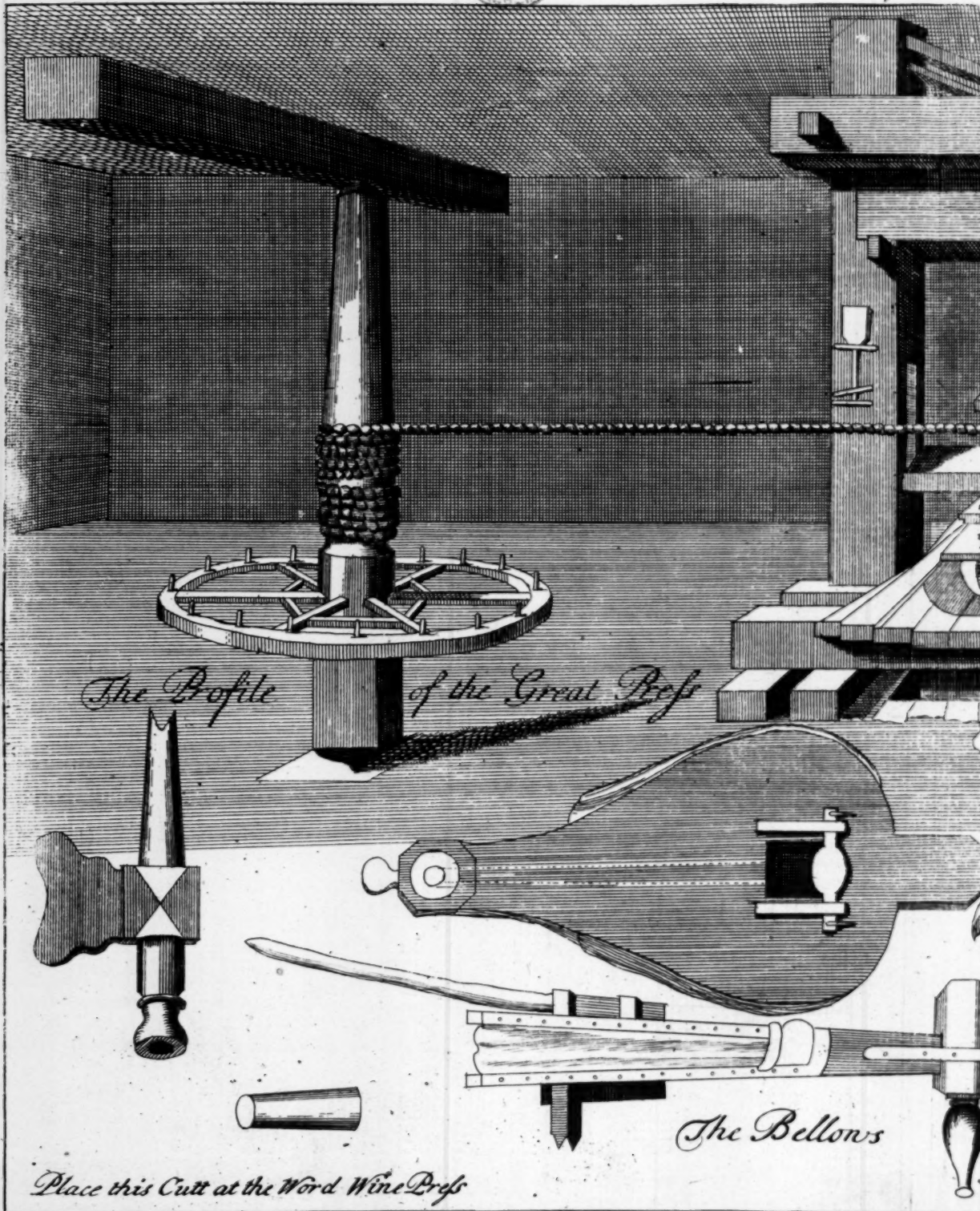
The 2d Sort grows naturally in *Pennsylvania* and *Maryland*; this hath a woody Stem, which rises 10 or 12 Feet high, sending out many Branches toward the Top; these have a purplish Bark, and are armed with short thick Spines standing by Pairs. The Leaves are unequally winged, and are composed of 4 or 5 Pair of oblong oval Lobes, terminated by an odd one; these stand close to the Mid-rib, having no Foot Stalks. The Mid-rib is armed on the under Side with some small Spines. The upper Side of the Leaves is of a deep green; their under Side is of a pale green; they have a warm biting Taste. The Bark of the Tree is used for curing the Tooth-ach, from whence it has the Name. The Flowers grow in loose Panicles like those of the former Sort, and these are succeeded by Fruit with 5 Cells, each including 1 hard shining Seed.

These Plants are generally propagated by Seeds, but as these never ripen in this Country, they must be procured from those Places where they naturally grow. When the Seeds arrive in *England*, they should be sown in Pots filled with light Earth as soon as possible, for they do not grow the first Year; and when they are kept out of the Ground till Spring, they frequently lie 2 Years in the Ground before the Plants appear; therefore the Pots should be plunged into the Ground up to their Rims, in an East aspected Border, where they may remain during the Summer; this will prevent the Earth in the Pots from drying too fast, which it is very apt to do when the Pots are set on the Ground in the Sun. The only Care to be taken of the Seeds, is, to keep the Pots constantly clean from Weeds, and in very dry Weather refresh them now and then with Water. In Autumn the Pots should be placed under a common hot Bed Frame, where they may be screened from Frost, or else plunged into the Ground in a warm Border, and covered with Tan to keep out the Frost and the following Spring they should be plunged into a hot Bed, which will bring up the Plants. When these appear, they must be frequently, but sparingly, watered, and kept clean from Weeds; and, as the Summer advances, they should be gradually inured to bear the open Air, into which they should be removed in June, placing them in a sheltered Situation, where they may remain till Autumn, when they must be placed in a hot Bed Frame to shelter them in Winter. The Spring following before the Plants begin to shoot, they should be carefully taken up, and each planted into a separate small Pot; these may be plunged into a gentle hot Bed, which will forward them greatly in putting out new Roots. The after

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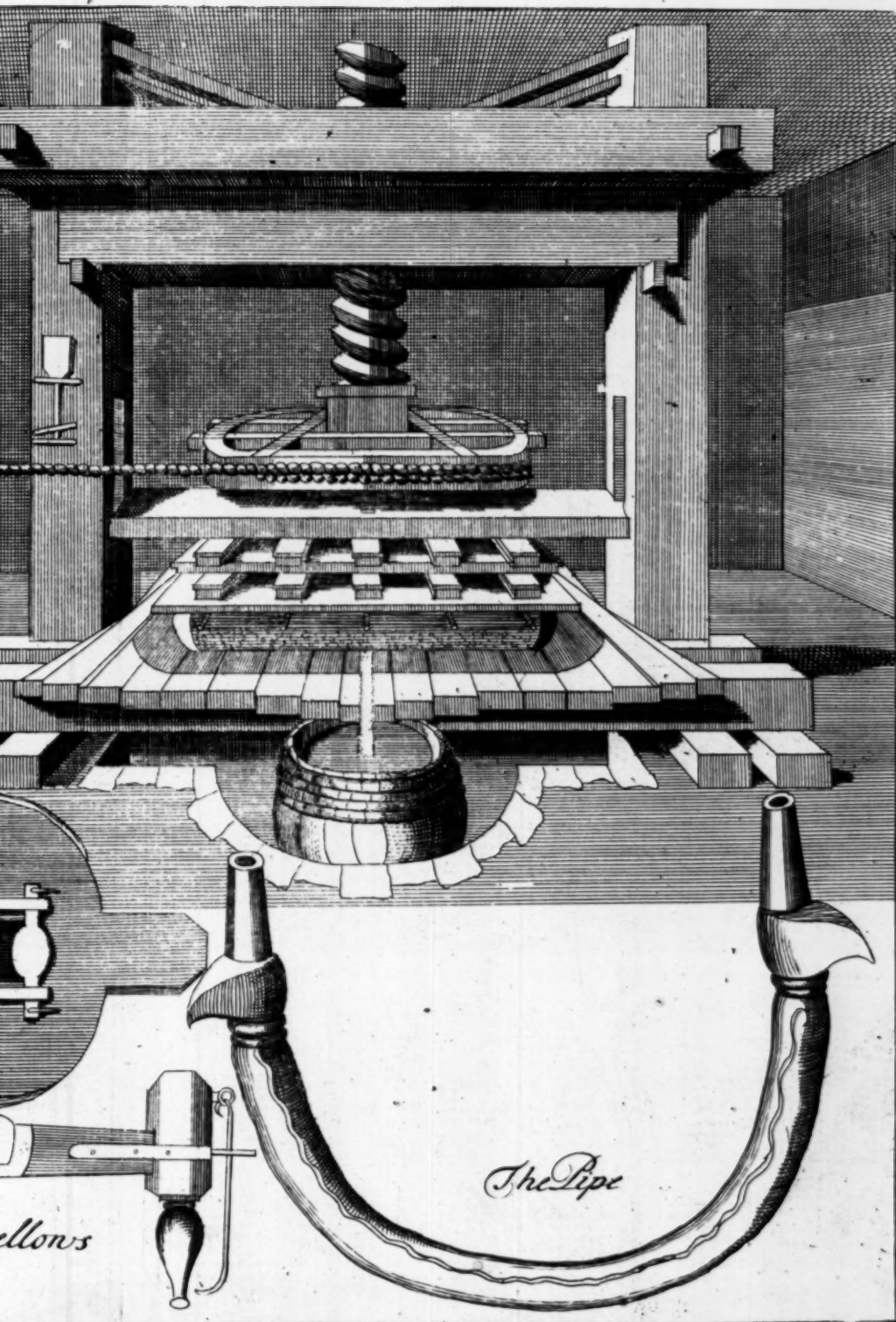
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after Care must be to shelter them for a Year or two in Winter, until the Plants have gotten Strength; then in the Spring, after the Danger of Frost is over, some of them may be turned out of the Pots, and planted in the full Ground in a warm sheltered Situation, where the second Sort will thrive very well, and resist the Cold; but the first is not quite so hardy, so these may be planted against a South Wall, where they will thrive very well. Some of the Plants of this Sort had been planted in the open Air, in the Chelsea Garden, some Years, where they had thriven and endured the Cold without any Covering, but the severe Winter, in 1740, destroyed them all. These Plants may be increased by cutting off some of their strong Roots, preserving their Fibres to them, and these planted in Pots filled with light Earth, plunging them into a moderate hot Bed, which will cause them to push out, and become Plants; but these will not thrive so well, nor grow near so large as those which are raised from Seeds.

XERANTHEMUM. Tourn. Inst. R. H. 499. Tab. 284. Lin. Gen. Pl. 851. Eternal Flower, or Ptarmica, vulg.

The Characters are,

The Flower is composed of hermaphrodite and female Florets, which have one common scaly Empalement. The hermaphrodite Florets, which form the Disk are Funnel-shaped, spreading, and cut into 5 Points; the female Florets, which compose the Border or Rays, are tubulous, and cut into 5 less equal Points; the hermaphrodite Florets have 5 short Stamina terminated by cylindrical Summits, and a short Germen, supporting a slender Style, crowned by a bifid Stigma. The Germen afterward becomes an oblong Seed crowned with Hairs, which ripens in the Empalement. The female Florets have no Stamina, but their Germen, Styles, and Seeds are the same as the hermaphrodite.

The Species are,

1. **XERANTHEMUM foliis lanceolatis patentibus.** Lin. Sp. Pl. 857. Eternal Flower with spreading Spear-shaped Leaves. *Xeranthemum flore simplici purpureo majore.* H. L. Eternal Flower, with a larger purple single Flower, commonly called Ptarmica.

2. **XERANTHEMUM foliis lineari lanceolatis utrinque tomentosis.** Eternal Flower with linear Spear-shaped Leaves downy on their under Side. *Xeranthemum flore simplici purpureo minore.* Tourn. Inst. R. H. 499. Eternal Flower with a smaller single purple Flower.

3. **XERANTHEMUM foliis lineari lanceolatis, capitulis cylindraceis, semine maximo.** Eternal Flower with linear Spear-shaped Leaves, cylindrical Heads, and a very large Seed. *Xeranthemum flore purpureo simplici minimo, semine maximo.* H. L. Eternal Flower with the smallest single purple Flower, and the largest Seed.

4. **XERANTHEMUM fruticosum erectum, foliis lanceolatis, ramis unifloris subnudis.** Lin. Sp. Pl. 858. Shrubby erect Eternal Flower with Spear-shaped Leaves, and almost naked Branches bearing one Flower. *Xeranthemum tomentosum latifolium, flore maximo.* Burman. Pl. Afr. 178. Tab. 66. fig. 2 Broad-leaved woolly Eternal Flower with the largest Flower.

5. **XERANTHEMUM caulibus frutescentibus provolutis, foliis tomentosis recurvatis.** Lin. Sp. Pl. 858. Eternal Flower with shrubby trailing Stalks, and downy recurved Leaves.

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Xeranthimoides procumbens, polii folio. Hort. Elb. 423. Trailing Bastard Eternal Flower with a Mountain Poley Leaf.

6. **XERANTHEMUM ramis unifloris imbricatis, foliis obsoletis.** Lin. Sp. Pl. 859. Eternal Flower with Branches terminated by one imbricated Flower, and obsolete Leaves. *Xeranthemum ramosum, foliolis squamosis linearibus, floribus argenteis.* Burm. Pl. Afr. Tab. 67. fig. 2. Branching Eternal Flower with small linear scaly Leaves, and silvery Flowers.

The 1st Sort grows naturally in Austria, and some Parts of Italy, but has been long cultivated in the English Gardens for Ornament. Of this there are the following Varieties; one with a large single white Flower; the purple and white with double Flowers, though these only differ in the Colour and Multiplicity of Petals in their Flowers, so are not mentioned as distinct Species, yet where their Seeds are carefully saved separate, they are generally constant.

These Plants are annual; they have a slender branching Stalk, which is covered with a white Down, angular, and furrowed; it rises about 2 Feet high, and is garnished with Spear-shaped Leaves an Inch and a Half long, and a Quarter of an Inch broad, which are hoary, sitting close to the Stalk, but spread out from it. The Stalk divides into 4 or 5 Branches; these are garnished with a few Leaves at their lower Parts, of the same Shape with the other, but are less. The upper Part of the Branches is naked, and sustains 1 Flower at the Top, composed of several female hermaphrodite Flowers included in one common scaly Empalement of a silvery Colour. The Florets are succeeded by oblong Seeds crowned with Hairs. The Petals of these Flowers are dry, so if they are gathered perfectly dry, and kept from the Air, they will retain their Beauty a long Time; they flower in July, August and September, and the Seeds ripen in Autumn.

The 2d Sort grows naturally in Italy. The Stalks of this do not rise much more than a Foot high, and do not branch so much as the former. The Leaves are narrower, and the whole Plant very hoary. The Flowers are not half so large as those of the former, and the Scales of their Empalements are very neat and silvery. This flowers at the same Time as the former.

The 3d Sort grows naturally in the Levant; this rises about the same Height as the first Sort. The Leaves are narrower, and are placed closer on the Stalks to the Top. In other Respects the Plants are very like, but the Flowers are much less, of a paler purple Colour, and have a cylindrical Empalement. The Seeds are very large, and seldom more than 3 or 4 in each Head. This Flowers about the same Time as the first.

These Flowers were formerly much more cultivated in the English Gardens than at present, especially the 2 Sorts with double Flowers, which the Gardeners near London propagated in great Plenty for their Flowers, which they brought to Market in the Winter Season, to adorn Rooms, to supply the Place of other Flowers which are not easy to be procured at that Season; for these, being gathered when they are fully blown and carefully dried, will continue fresh and beautiful many Months; but as there are no other Colours in these Flowers but white and purple, the Gardeners had a Method

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of dipping them into various Tinctures, so as to have some of a fine blue, others scarlet, and some red, which made a pretty Variety; and, if they were rightly stained, and afterwards hung up till they were thorough dry, they would continue their Colours as long as the Flowers lasted. The Stalks of the Flowers were not set in Water, but the Pots or Glasses were half filled with dry Sand, into which the Stalks were placed, and in these they would continue in Beauty the whole Winter.

These Plants are propagated by Seeds, which may be sown either in the Spring or Autumn on a Border of light Earth, but the latter Season is preferable, for those Plants which come up in Autumn will flower sooner. The Flowers will be doubler and much larger than those which are sown in the Spring, and from these good Seeds may be always obtained, whereas the Spring Plants many Times fail in cold Years, and in hot dry Seasons the Plants do not grow to any Size.

When the Plants come up, and are about 2 Inches high, they should be pricked out into another Border under a warm Wall, Pale, or Hedge, at about 4 or 5 Inches Distance from each other, or into the Borders of the Flower Garden. In this Place the Plants will endure the Cold of our ordinary Winters extremely well, and in the Spring will require no farther Care, but to keep them clear from Weeds, for they may remain in the same Place for good. In June they will begin to flower, and the Beginning of July they will be fit to gather for drying; but a few of the best and most double Flowers of each Kind should be suffered to remain for Seed, which in about 6 Weeks or two Months Time, will be ripe, and the Plants will perish soon after; so that the Seeds must be annually sown, in order to preserve the Kinds.

The 4th Sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby Stalk, 3 or 4 Feet high, dividing into 4 or 5 Branches, whose lower Parts are garnished with thick-pointed Leaves, about 2 Inches long and 1 broad, which are hoary on their under Side, and are ranged without Order. The upper Part of the Branches are naked, and are terminated by one large yellow Flower composed of many oblong acute-pointed Rays, in the Border, and the Middle or Disk, which is prominent, is made up of hermaphrodite Florets which are of a splendid yellow Colour.

The 5th Sort grows naturally at the *Cape of Good Hope*. The Stalks of this Sort are very slender, ligneous, and trail on the Ground; they extend 3 or 4 Feet in Length, and are garnished with small silvery Leaves placed without Order, which fit close to the Stalks, and are reflexed. The Flowers are produced from the Wings of the Branches, sometimes one, and at others 2 or 3 Flowers arise at the same Point; these have scaly Empalements; their Border or Rays are composed of many female Florets of a white Colour, and their Middle of hermaphrodite Florets; these are succeeded by oblong Seeds crowned with Hairs. This Plant flowers in July and August, but the Seeds seldom ripen in England.

The 6th Sort is a Native of the Country near the *Cape of Good Hope*; this has a shrubby branching Stalk, which rises 3 or 4 Feet high. The Branches are slender, and like those of the *Spanish Broom* but are hoary;

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these have very small Leaves resembling Scales, which fit close to the Branches; they are narrow and hoary, ending in acute Points. The Stalks are each terminated by one large silvery Flower, having a stiff dry scaly Empalement. The Rays of the Flower are composed of many dry female Florets, and the Disk or Middle is made up of hermaphrodite Florets; these are succeeded by oblong Seeds crowned with Hairs, which do not ripen in England.

As these Plants do not ripen their Seeds in England, they are propagated by Cuttings, which if planted on a Bed of light Earth, during any of the Summer Months, and shaded from the Sun, will put out Roots. When these have gotten sufficient Roots, they should be carefully taken up, and planted into separate Pots filled with light Earth, and placed in a shady Situation till they have taken fresh Root; then they may be removed to a sheltered Situation, where they may have more Sun, and here they may remain till Autumn, when they must be removed into Shelter, for they are too tender to live abroad through the Winter in England, though they do not require any artificial Warmth. I have kept these Plants in a common hot Bed Frame all Winter, exposing them always to the open Air in mild Weather, but covering them in Frost, and these Plants have been stronger, and have flowered better than those which were placed in the Green-house; so that I would recommend this Method of Treatment as the best, for the Plants are apt to draw up weak in a Green-house, and that prevents their flowering; nor are the Plants near so handsome as those which are more exposed to the open Air.

In the Summer Time they should be placed abroad in a sheltered Situation with other hardy exotick Plants, and in dry Weather they will require to be often watered, for they are thirsty Plants, but in Winter it should be sparingly given to them. As these Plants are not of long Duration, there should be young Plants propagated to succeed them, for if they live 4 or 5 Years, it is full long enough, because after that Age, they become unightly.

XIMENIA. Plum. Gen. Nov. 6. Tab. 21. Lin. Gen. Pl. 1105.

The Characters are,

The Flower has a small Empalement of 3 Leaves, which falls off; it has 1 Bell-shaped Petal cut into 3 Segments at the Top, which turn backward; it has 3 short Awl-shaped Stamina, terminated by single Summits, and a small oval Germen, situated under the Flower, supporting a very short Style crowned by a beaded Stigma. The Germen afterward turns to an oval fleshy Berry, including an oval Nut with 1 Cell, containing 1 Seed of the same Form.

The Species are,

1. XIMENIA foliis solitariis. Lin. Sp. Pl. 1193. Ximania with single Leaves. Ximania aculeata flore villosa, fructu luteo. Plum. Gen. 6. Prickly Ximania with a hairy Flower and a yellow Fruit.

2. XIMENIA foliis geminis. Lin. Sp. Pl. 1194. Ximania with Twin Leaves. Agibaid. Alpin. Egypt. 38.

The 1st Sort grows naturally in the Islands of the West-Indies; it rises with a woody Stalk 20 Feet high, sending out several Branches on every Side, which are armed with Thorns, and garnished with Spear-shaped Leaves

Leaves standing round the Branches without Order. The Flowers are produced at the End of the Branches; they have 1 Bell-shaped Petal cut almost to the Bottom into 3 Segments which are rolled backward, and are hairy; within they are of a yellow Colour, and are succeeded by an oblong oval fleshy Fruit shaped like a Plum, including a hard Nut of the same Form.

The 2d Sort grows naturally in *Egypt*, where it becomes a Tree of middling Size. The Stem is large and woody; the Branches are slender and stiff; they have a green Bark, and are armed with strong Spines; the Leaves come out by Pairs; they are larger than those of the Box Tree, and end in Points, but are of the like Consistence and Colour. The Flowers come out on the Side of the Branches; they are shaped like those of Hyacinth, but are small, and of a white Colour; these are succeeded by oblong black Berries including an oval Nut having one Kernel or Seed.

Both these Sorts are propagated by Seeds, which must be procured from the Countries where they grow naturally; these should be sown in Pots filled with light Earth, and plunged into a hot Bed of Tanners Bark. If the Seeds are fresh, the Plants will appear in 6 Weeks or 2 Months. When these are about 3 Inches high, they must be each carefully transplanted into a separate small Pot filled with light Earth, and plunged into a good hot Bed of Tanners Bark, where they must be shaded from the Sun, till they have taken new Root; then they must be treated as other tender Plants from the warm Countries. During the first Summer they may be kept in the Tan Bed under Frames, where they will thrive better than in the Stove, but in Autumn, when the Nights grow cool, they should be removed into the Stove and plunged into the Tan Bed, and in this they should always be kept, observing to shift them into larger Pots when they require it, and in Summer, when the Season is warm, they should have a large Share of free Air admitted to them. With this Management the Plants will thrive well, but they cannot be expected to flower very soon in this Country.

XIPHION or *Xiphium*. *Tourn. Inst. R. H.* 362. *Tab.* 189. *Iris. Lin. Gen. Pl.* 57. Bulbous Iris, or Flower-de-luce.

The Characters are,

The Flowers have each a permanent Spatha or Sheath; they have 6 Petals, the 3 outer broad, obtuse, and reflexed, and the inner erect, pointed, and joined to the other at their Base; they have 3 Awl-shaped Stamina which lie upon the reflexed Petals, and are terminated by oblong depressed Summits, and an oblong Germen under the Flower, supporting a short Style crowned by a tripartite Stigma. The Germen afterward becomes an oblong angular Capsule with 3 Cells, filled with roundish Seeds.

The Species are,

1. *XIPHIMUM foliis carinatis caule longioribus*. Bulbous Iris with Keel-shaped Leaves which are longer than the Stalk. *Xiphion Persicum præcox, flore variegato. Tourn. Inst. R. H.* 363. Early Persian Bulbous Iris with a variegated Flower.

2. *XIPHIMUM foliis subulato-canaliculatis, caule brevioribus*. Bulbous Iris with channeled Awl-shaped Leaves which are shorter than the Stalk. *Iris bulbosa, flore caru-*

leo violaceo. C. B. P. 38. Bulbous Iris with a blue Violet Flower.

3. *XIPHIMUM foliis subulato-canaliculatis, floribus majoribus*. Bulbous Iris with channeled Awl-shaped Leaves, and larger Flowers. *Xiphion latifolium, caule donatum, flore caruleo. Tourn. Inst. R. H.* 363. Broad-leaved Bulbous Iris having a Stalk and a blue Flower.

4. *XIPHIMUM foliis planis caule longioribus*. Bulbous Iris with plain Leaves which are longer than the Stalk. *Iris bulbosa latifolia, flore caruleo. J. B.* 2. 703. Broad-leaved Bulbous Iris with a blue Flower.

The 1st Sort grows naturally at *Persia*, but has been many Years cultivated in the *English* Gardens for the Beauty of its Flowers; it has an oval bulbous Root, from which come out 5 or 6 pale green Leaves hollowed like the Keel of a Boat; they are about 6 Inches long, and 1 broad at the Base, ending in Points. Between these the Flower Stalk arises, which is seldom above 3 Inches high, supporting 1 or 2 Flowers, which are included in Spathæ (or Sheaths); these have 3 erect Petals called Standards, which are of a pale Sky blue Colour, and 3 reflexed Petals called Falls, which on their Outside are of the same Colour, but the Lip has a yellow Streak running through the Middle, and on each Side are many dark Spots, with one large deep purple Spot at the Bottom. These Flowers have a very fragrant Scent, and generally appear in *February*, which renders them more valuable.

The 2d Sort grows naturally in the warm Parts of *Europe*. There are several Varieties of this Species: the most common Sort is blue, but there is one with a yellow, and another with a white Flower; one with a blue Flower having white Falls, another with yellow Falls, one with a Violet-coloured Flower having blue Falls, with some others, but these are all supposed to be Varieties, which have been produced by Culture.

The Root of this is bulbous; the Leaves are hollow or channeled, ending in Points, where their two Sides meet; these are not so long as the Flower Stalk, which rises between them, and is embraced by the Base of the Leaves. This supports 2 or 3 Flowers which are each inclosed in a separate Sheath, at the Top of the Stalk. The Flowers are shaped like those of the first Sort, but differ in their Colour. This Sort flowers in *May*, and the Seeds ripen in *August*.

The 3d Sort has much larger bulbous Roots than either of the former. The Leaves are shaped like those of the second Sort, but are much larger; the Flower Stalk is near twice the Height of the second Sort, and the Flowers are more than double their Size. This is by some supposed to be only a Variety of the second Sort, but I think it a distinct Species, for I have many Years raised a great Number of the Plants from Seed, and have never found a single one degenerate to the second Sort, and have raised many of the second Sort from Seeds, without one Instance of a Plant improving to the third Sort.

There is a great Variety of this Species, which differ in the Colours of their Flowers. Some are of a deep blue, others of a light or Sky blue, some of a deep purple, and others with fine variegated Flowers, which make a fine Appearance during their Continuance, which is not long, unless the Season proves cold, or the Flowers

are shaded from the Sun. This Sort flowers 5 or 6 Weeks after the second Sort, which is also an Argument for its being specifically different.

The 4th Sort grows naturally in *Spain* and *Portugal*. The Root of this has a dark-coloured Coat, but is white within, and of a sweet Taste. The Leaves are 8 or 9 Inches long, and more than an Inch broad at their Base; they are almost plain, but toward their Base are hollowed like the Keel of a Boat, and end in Points, being of a pale green on their upper Side, and a little hoary on their under. The Flowers stand on naked Foot Stalks which arise from the Root, and grow 5 or 6 Inches high, sustaining 2 or 3 Flowers at the Top, which are each wrapped up in a separate Sheath; these are shaped like those of the other Sorts, and have a very agreeable Odour; they appear in *May*, but are of short Duration.

There are 4 or 5 Varieties of this Species which differ in the Colour of their Flowers, but the most common Colour is blue.

These are propagated by Offsets from their Roots, but to obtain new Varieties, they must be propagated by Seeds in the following Manner.

Having procured a Parcel of Seeds from good Flowers, the Beginning of *September*, you should provide some flat Pans or Boxes, which must have Holes in their Bottoms to let the Moisture pass off; these should have Pieces of Tile or Oyster Shells laid over each Hole to prevent their being stopped; then they must be filled with fresh light sandy Earth, and the Seeds sown thereon pretty thick, observing to scatter them as equally as possible; then cover them over about half an Inch thick with the same light fresh Earth, and place the Boxes or Pans where they may have the Morning Sun till Eleven o'Clock: and if the Season should prove very dry, they must be now and then refreshed with Water.

In this Situation they may remain until the Middle of *October*, when they should be removed into a warmer Situation where they may have the full Sun most Part of the Day, and screened from severe Frosts; in which Place they must abide all the Winter, observing to keep them clear from Weeds and Moss, which, at this Season, are very apt to spread over the Surface of the Earth, in Pots, when they are exposed to the open Air.

In the Spring the Plants will appear above Ground, when, if the Season is dry, they must be now and then refreshed with Water, and constantly kept clear from Weeds; and as the Season advances, and the Weather becomes warm, they should be again removed into their former shady Situation, where they may enjoy the Morning Sun only. When the Leaves begin to decay (which will be in *June*), they must be cleared from Weeds, and dead Leaves, and some fresh Earth sifted over them about half an Inch thick, still suffering them to abide in the same Situation all the Summer Season; during which Time they will require no farther Care, but to keep them clear from Weeds, until the Beginning of *October*; when they must be again removed into a warm Situation, and the Surface of the Earth lightly taken off, and some fresh Earth sifted over them.

In this Place they must remain all the Winter, as before; and in the Spring they must be treated as was directed for the former Years.

When the Leaves are decayed, the Bulbs should be

carefully taken up (which may be best done by sifting the Earth through a fine Sieve); and a Bed or two of good light fresh Earth should be prepared, into which the Bulbs must be planted, at about 3 Inches asunder each Way, and 3 Inches deep. These Beds must be constantly kept clean from Weeds and Moss; and if the Winter should prove severe, the Bed should be covered with rotten Tanners Bark, or Pease Haulm to keep out the Frost; and in the Spring, just before the Plants come up, the Surface of the Beds should be stirred, and some fresh Earth sifted over them about half an Inch thick, which will greatly strengthen the Roots.

During the Spring and Summer they must be constantly weeded; and at *Michaelmas* the Earth should be again stirred; and some fresh sifted over the Beds again, as before; observing in Winter and Spring still to keep the Beds clean, which is the whole Management they will require, and in *June* following the greatest Part of the Roots will flower; at which Time you should carefully look over them, and put down a Stick by all those whose Flowers are beautiful, to mark them; and as soon as their Leaves are decayed, these Roots may be taken up to plant in the Flower Garden among other choice Sorts.

But the Nursery Beds should still remain; observing to keep them clear from Weeds, as also to sift fresh Earth over them, as was before directed; and the following Season the remaining Part of the Roots, which did not flower the foregoing Season, will now shew their Blossoms; so that you may know which of them are worth preserving in the Flower Garden, which should now be marked; and when their Leaves are decayed, they must be taken up, and planted, with the other fine Sorts, in an East Border of light fresh Earth; but the ordinary Sorts may be intermixed with other bulbous-rooted Flowers in the larger Borders of the Pleasure Garden, where, during their Continuance in flower, they will afford an agreeable Variety.

But after these choice Flowers are obtained from Seeds, they may be increased by Offsets, as other bulbous Flowers are. The Offsets should be planted in a separate Border from the blowing Roots, for one Year, until they have Strength enough to produce Flowers, when they may be placed in the Flower Garden with the old Roots.

These Bulbs need not be taken up oftener than every other Year; which should always be done soon after their Leaves decay, otherwise they will send forth fresh Fibres, when it will be too late to remove them; nor should they be kept long out of the Ground; a Month is full enough; for when they are kept longer, their Bulbs are subject to shrink, which causes their Flowers to be weak the following Year.

The Earth which the Flowers thrive best in, is a light sandy Loam; and if it be taken from a Pasture Ground, with the Sward, and laid in a Heap until the Grass is thoroughly rotted, it will be still better; for these Bulbs do not delight in a rich dunged Soil; nor should they be planted in a Situation where they may be too much exposed to the Sun; for in such Places their Flowers will continue but a few Days in Beauty, and their Roots are apt to decay; but in an East Border, where they have the Sun until Eleven of the Clock, they will thrive

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thrive and flower extremely well, especially if the Soil be neither too wet, nor over dry. From the most beautiful of these Flowers should Seeds be saved, and sown every Year; which will always furnish new Varieties, some of which will greatly exceed the original Kinds.

The *Persian Iris* is greatly esteemed for the Beauty and extreme Sweetness of its Flowers, as also for its early Appearance in the Spring, it generally being in Perfection in *February*, or the Beginning of *March*, according to the Forwardness of the Season, at which Time there are few other Plants in Beauty.

This may be propagated by Seeds, as the other Sorts: but the Boxes in which they are sown, should be put under a Garden Frame in Winter, to shelter them from hard Frost; because, while the Plants are young, they

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are somewhat tender. From the Seeds of this Kind I could never obtain any Varieties, their Flowers being always the same.

These Plants are also propagated by Offsets, as the other Sorts; but their Roots should not be transplanted oftener than every third Year; nor should they be ever kept out of the Ground long; because their Roots will shrink and entirely decay when they are long above Ground, so as not to be recovered again. This Sort was formerly more common in the Gardens near *London* than at present; which, I suppose, has been occasioned by keeping the Roots above Ground too long, which destroyed them.

XYLON. See *Bombax*.

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YEW TREE. See *Taxus*.

YUCCA. *Dillen. Gen. Nov. 5. Lin. Gen. Pl. 388. Cordylina. Roy. Lug. Prod. 22. The Indian Yucca, or Adam's Needle.*

The Characters are,

The Flower has no Empalement; it has a Bell-shaped Flower composed of 6 large Petals whose Tails are joined, and 6 short reflexed Stamina terminated by small Summits, and an oblong three-cornered Germen which is longer than the Stamina, having no Style, crowned by an obtuse Stigma with 3 Furrows. The Germen afterward turns to an oblong three-cornered Capsule divided into 3 Cells, filled with compressed Seeds, lying over each other in a double Arrangement.

The Species are,

1. *YUCCA foliis integerrimis. Vir. Cliff. 29. Yucca* with entire Leaves. *Yucca foliis Aloë. C. B. P. 91. Yucca*, with Leaves like those of the *Aloë*, commonly called *Adam's Needle*.

2. *YUCCA foliis crenulatis strictis. Lin. Sp. Pl. 319. Yucca* with narrow Leaves slightly crenated. *Yucca arborescens, foliis rigidioribus rectis serratis. Dill. Hort. Elb. 435. Tree-like Yucca* with strait, stiff, sawed Leaves.

3. *YUCCA foliis crenatis nutantibus. Lin. Sp. Pl. 319. Yucca* with nodding crenated Leaves. *Yucca draconis folio serrato. Hort. Elb. 437. Yucca* with a sawed Dragon-tree Leaf.

4. *YUCCA foliis serrato-filamentosis. Lin. Sp. Pl. 319. Yucca* with sawed thready Leaves. *Yucca foliis filamentosis. Mor. Hist. 2. p. 4:9. Thready-leaved Yucca.*

The 1st of these Plants is a Native of *Virginia* and other Parts of *North America*, but has been long an Inhabitant of the *English Gardens*, where it was formerly nursed up in Green-houses, supposing it was too tender to live in the open Air in Winter, but of late Years the Plants have been planted into the full Ground, where they resist the greatest Cold of our Winters, when they are in a dry Soil.

This Sort seldom rises with a Stem above 2 Feet high, which is garnished with Leaves almost to the Ground. The Leaves of this are broad, stiff, and have

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the Appearance of those of the *Aloë*, but are narrower; they are of a dark green Colour, ending in a sharp black Spine. This Sort frequently produces its Spikes of Flowers, which rise from the Center of the Leaves. The Stalks grow 3 Feet high; they branch out on every Side to a considerable Distance, but the Flowers are placed very sparsely on the Stalks, which renders it less beautiful than the Flowers of the other Kinds; they are white within, but each Petal is marked with a purple Stripe on the Outside; they are Bell-shaped, and hang downward; they appear in *August* and *September*, but are not succeeded by Seeds in *England*.

The 2d Sort rises with a thick, tough, fleshy Stalk, 10 or 12 Feet high, having a Head or Tuft of Leaves at the Top; these are narrower and stiffer than those of the former Sort, and are of a lighter green Colour; their Edges are slightly sawed, and their Points end with sharp Thorns. The Flower Stalk rises in the Center of the Leaves, and is from 2 to 3 Feet long, branching out into a pyramidal Form. The Flowers grow close on the Branches, and form a regular Spike; they are of a bright purple Colour on the Outside, and white within, making a fine Appearance. The Flowers appear at the same Time with the former, but the Plants of this do not flower so often as the other Sort; and when they flower, the Head decays, but one or two young Heads come out from the Side of the Stalk, below the old one.

The 3d Sort grows naturally in *South Carolina*, from whence I received the Seeds by the Title of Oil Seed. The Stalks of this Sort rise about 3 or 4 Feet high; the Leaves are narrow, of a dark green Colour, and hang downward; they are sawed on their Edges, and end in acute Spines. I never saw the Flowers of this Sort, but have been informed they are white.

The threaded Sort is not so common as the others in the *English Gardens*, but as it is a Native of *Virginia*, it might easily be procured in Plenty from thence. The Stalks and Leaves are like those of the first Sort, but the Leaves are obtuse, and have no Spine at their Ends. From the Side of the Leaves come out long Threads which hang down.

All these Plants are either propagated by Seed, when obtained from Abroad; or else from Offsets or Heads taken

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taken from the old Plants, after the Manner of Aloes.

When they are raised from Seeds, they should be sown in Pots filled with light fresh Earth, and plunged into a moderate hot Bed, where the Plants will come up in 5 or 6 Weeks after; and when they are 2 or 3 Inches high, they should be transplanted each into a separate small Pot filled with light fresh Earth, and plunged into the hot Bed; where the Plants should have Air and Water in Proportion to the Warmth of the Season, and the Bed wherein they are placed.

In July they should be inured, by Degrees, to bear the open Air; into which they must be removed, to harden them before Winter; placing them in a well-sheltered Situation, where they may remain until the Beginning of October, when they must be removed into the Green-house, where they may be arranged among the hardier Sorts of Aloes, and should be treated in the Manner already directed for them; to which the Reader is desired to turn, for further Instructions.

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ZANTHOXYLUM. See Xanthoxylum.
ZEA. Lin. Gen. Pl. 926. Mays. Tourn. Inst. R. H. 531. Trb. 303, 304, 305. Indian, or Turkey Corn in French *Ble de Turquie*.

The Characters are,

It has male and female Flowers situated at remote Distances on the same Plant. The male Flowers are disposed in a loose Spike, having oval, oblong, chaffy Empalements, opening with 2 Valves, each inclosing 2 Flowers; these have 2 short compressed Nectaria, and 3 Hair-like Stamina, terminated by quadrangular Summits, which open in 4 Cells at the Top. The female Flowers, which are situated below the male, are disposed in a thick Spike inclosed with Leaves; these have thick chaffy Empalements with 2 Valves. The Flowers are composed of 2 short membranaceous broad Valves which are permanent, and a small Germen, with a slender Style, crowned by a single Stigma, which is hairy toward the Point. The Germen afterward turns to a roundish compressed Seed, angular at the Base, and half inclosed in its proper Receptacle.

The Species are,

1. *ZEA caule altissima, foliis latioribus pendulis, spica longissima.* Indian Corn with the tallest Stalk, broader hanging Leaves, and the longest Spike. Mays *granis aureis*. Tourn. Inst. R. H. 531. Indian Maize with yellow Grains.

2. *ZEA caule graciliore, foliis carinatis pendulis, spica longa gracili.* Indian Corn with slenderer Stalks, Keel-shaped hanging Leaves, and a long slender Spike. Mays *granis albicantibus* Tourn. Inst. R. H. 531. Indian Maize with white Grains.

3. *ZEA caule humiliori, foliis carinatis pendulis, spica brevior.* Indian Corn with a lower Stalk, hanging Keel-shaped Leaves, and a shorter Spike. Mays *spica aurea alba*. Tourn. Inst. R. H. 531. Turkey or Indian Maize, with a yellow and white Spike.

These 3 Species have been generally supposed but one, and no more than accidental Variations; but from

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When these Plants have acquired Strength, those of the common Sort, and also the threaded, may be afterwards turned out into a warm Border, where they will endure the Cold of our ordinary Winters very well; but the other Sorts must be kept in Pots, that they may be sheltered in Winter; and if they are treated as the large American Aloe, they will do very well.

The Offsets taken from the old Plants should be laid in a dry Place, for a Week or ten Days, before they are planted, that their Wounds may heal; otherwise they will be subject to rot with Moisture.

As the second and third Sorts do not put out Offsets so plentifully as the first, in order to propagate them, the Heads of the Plants may be cut off in June; and after the wounded Part is dry, the Heads may be planted, which will soon take Root, provided the Pots are plunged into a moderate hot Bed; and this cutting off the Heads will occasion the Stems to put out Suckers, which they seldom do without until they flower; so that, by this Method the Plants may be obtained in Plenty.

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long Experience I can affirm, they are different, and do not alter by Culture.

The 1st Sort grows naturally in the Islands of the West Indies; this hath a very large strong Stalk, which rises to the Height of 10 or 12 Feet. The Leaves are long, broad, and hang downward; they have a broad white Mid-rib. The male Flowers come out in branching Spikes at the upper Part of the Stalks; these are 8 or 10 inches long. The female Flowers come out from the Bottom of the Leaves on the Side of the Stalk; they are disposed in a close, long, thick Spike, and are covered closely with thin Leaves; out of the End of the Covers, hang a small long Bunch of Filaments or Threads, which are supposed to receive and convey the Farina of the male Flowers to the Germen of the female. When the Seeds of this Sort are ripe, the Spikes or Ears are 9 or 10 Inches long, and sometimes a Foot, but these rarely ripen in England.

I have not seen any Variety of Colours in this Species, though it is very probable there are the same Varieties in the Colour of the Grain, as in the other Species; but as this is less common in Europe, we are not so well acquainted with it.

The 2d Sort is cultivated in Italy, Spain, and Portugal. The Stalks of this Sort are slenderer than those of the former, and seldom rise more than 6 or 7 Feet high. The Leaves are narrower than those of the first Sort, and are hollowed like the Keel of a Boat, and their Tops hang downwards. The Spikes of male Flowers are shorter than those of the first, and the Ears, or Spikes of Grain are slenderer, and not more than 6 or 7 Inches long. The Grains of this Sort do not come to Maturity in England, unless the Season proves very warm, and the Grains are planted early in a warm Soil and Situation.

The 3d Sort is cultivated in the northern Parts of America, and also in Germany. The Stalks of this are slender, and seldom rise more than 4 Feet high. The Leaves

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Leaves are shorter and narrower than those of the two former; they are hollowed like the Keel of a Boat, and their Tops hang down. The Spikes of male Flowers are short, and the Ears, or Spikes of Grain, are seldom more than 4 or 5 Inches long. This Sort ripens its Grain, perfectly well in *England*, in as little Time as Barley, so may be cultivated here to Advantage.

There are several Varieties of the two last Species, which differ in the Colour of their Grain. The most common Colour is that of a yellowish white; but there are some with deep yellow, others with purple, and some with blue Grains; and when the different Colours are planted near each other, the Farina will mix, and the Ears will have Grains of several Colours intermixed; but when the Grains of the different Varieties are planted at a proper Distance from each other, the Produce will be the same with the Grains which were sown.

These Plants are seldom cultivated in *England* for Use, but in *Italy* and *Germany* it is the Food of the poor Inhabitants; as it is also in many Parts of *North America*, where it is treated in the following Manner.

They first dig the Ground well in the Spring, and after having made it level, they draw a Line across the whole Piece intended to be planted; then they raise little Hills at about 3 or 4 Feet distance, into each of which they put 2 or 3 good Seeds, covering them about an Inch thick with Earth; then they move the Line 4 Feet farther, continuing to do the same through the whole Spot of Ground, so that the Rows may be 4 Feet asunder, and the Hills 3 or 4 Feet Distance. Six Quarts of this Seed are generally allowed to an Acre of Land, which, if the Soil be good, will commonly produce 50 Bushels of Corn.

In planting this Corn, where they observe to plant the Grain of any one Colour in a Field by itself, and no other coloured Grain stand near it, it will produce all of the same Colour again, as hath been affirmed by many curious Persons who have tried the Experiment; but if the Rows are alternately planted with the Grain of different Colours, they will interchange, and produce a Mixture of all the Sorts in the same Row; and frequently on one and the same Spike; and some do affirm they will mix with each other, at the Distance of 4 or 5 Rods, provided there is no tall Fence or Building between to intercept them.

There is nothing more observed in the Culture of this Grain, but only to keep it clear from Weeds, by frequent hoeing of the Ground; and when the Stems are advanced, to draw the Earth up in a Hill about each Plant, which, if done, will greatly strengthen them, and preserve the Ground about their Roots moist for a considerable Time.

When the Corn is ripe, they cut off the Stalks close to the Ground, and after having gathered off the Spikes of Grain, they spread the Stalks in the Sun, to harden and dry, which they afterward use in the same Manner as Reeds in *England* for making Fences, covering Sheds, &c. for which Purpose they are very useful to the Inhabitants of warm Countries; and when there is a Scarcity of Forage, they feed their Cattle with them green, as fast as the Corn is gathered off.

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The Corn is ground to Flour, and the poorest Sort of People in *America* and also in *Italy* and *Germany*, make their Bread of this Flour; and in many of the warmer Countries, the Inhabitants roast the whole Spikes, and dress them many different Ways, making several Dishes of it; but this Grain seldom agrees with those who have not been accustomed to eat it, however, in Times of Scarcity of other Grain, this would be a better Substitute for the Poor, than Bean Flour, or other Sorts, which have been used in *England*; and at all Times will be found a hearty Food for Cattle, Hogs, and Poultry, so that in light sandy Lands, where Beans and Peas succeed not well, this Grain may be cultivated to answer both Purposes to Advantage.

If this Grain is cultivated by the Horse-hoeing Husbandry, it may be done at less Expence than in any other Method; for this is one of the Plants which is more particularly adapted for this Husbandry, therefore I shall here give an Account of the Method in which it has been cultivated by the Horse Hoe, and has succeeded beyond Expectation.

The Land was very light and sandy, and far from being rich; this was ploughed deep before Winter, and laid up in high Ridges till the Spring, when it was well harrowed to break it fine, and the Beginning of April the Ground was again ploughed, laid level, and well harrowed to make the Surface smooth; then the Seeds were sown in Drills, which were made 4 Feet asunder, into which the Seeds were dropped at about 8 or 9 Inches Distance. When the Plants were come up 3 Inches high, where any of them were too close, they were cut up with a Hand Hoe, and the Intervals between the Rows were ploughed shallow to destroy the young Weeds. But when the Stems were advanced, the Ground in the Intervals was ploughed deeper, and the Earth laid up to the Plants on both Sides; and when the Weeds began to grow again, the Ground was a third Time ploughed to destroy them; this kept the Ground pretty clean from Weeds till the Grain was ripe, as the Season was not wet; but otherwise it would have required a fourth Ploughing to answer this Purpose. The Stalks of these Plants produced from 3 to 6 Spikes of Grain each, which was a great Increase.

The Time for sowing this Corn, is about the same for Barley, in light warm Land it may be sown the latter End of March or the Beginning of April; but in cold Ground, the Middle or End of April will be early enough, for the Grain is subject to rot in cold Land, especially if the Season proves wet. When the large Sorts are planted in a Garden for Curiosity, their Seeds should be sown on a moderate hot Bed the Beginning of March, and when the Plants are fit to remove, they should be transplanted on another moderate hot Bed to bring them forward; but they must not be kept too closely covered, for that will draw them up weak; therefore, when the Weather is mild, they should be injured to bear the open Air; and the Beginning of May, they should be taken up with Balls of Earth to their Roots, and transplanted into a warm Border at 3 or 4 Feet Distance, carefully watering them if the Weather proves dry, until they have taken new Root, after which they will require no other Care but to keep them clean from

Weeds. If the Season should prove warm, these Plants will ripen the Corn in Autumn.

ZIZIPHORA. Lin. Gen. Pl. 33. *Clinopodium*. Tourn. Inst. R. H. 194. Tab. 92. Field Basil.

The Characters are,

The Flower hath a long, rough, cylindrical Empalement, slightly cut into 5 Parts at the Brim. The Flower is of the labiated Kind, having a long cylindrical Tube. The upper Lip is oval, reflexed, and entire; the under Lip (or Beard) is divided into 3 equal Segments; it has 2 spreading Stamina terminated by oblong Summits, and a quadrifid Germen supporting a bristly Style, crowned by a sharp-pointed inflexed Stigma. The Germen afterward turns to 4 oblong Seeds, which ripen in the Empalement.

The Species are,

1. **ZIZIPHORA capitulis terminalibus, foliis ovatis.** Lin. Sp. Pl. 21. Field Basil with Heads terminating the Stalks, and oval Leaves. *Clinopodium fistulosum pumilum, Indiae occidentalis, summo caule floridum.* Pluk. Alm. 111. Low fistulous Field Basil of the West-Indies, having Flowers on the Top of the Stalk.

2. **ZIZIPHORA floribus lateralibus, foliis lanceolatis.** Lin. Sp. Pl. 21. Field Basil with Flowers growing on the Sides of the Stalk, and Spear-shaped Leaves. *Acinos Syriaca, folio mucronato, capsulis hirsutis.* Mor. Hist. 3. p. 404. Syrian Field Basil with an acute-pointed Leaf, and hairy Capsules.

3. **ZIZIPHORA floribus lateralibus, foliis inferioribus, lineari lanceolatis, summis ovato-mucronatis.** Field Basil with Flowers growing on the Sides of the Stalks, the lower Leaves linear and Spear-shaped, and those on the Top oval, terminating with long Points.

4. **ZIZIPHORA foliis lanceolatis, floribus terminalibus.** Hort. Cliff. 305. Field Basil with Spear-shaped Leaves, and Flowers terminating the Stalks. *Clinopodium Alpium roseum, satyrææ foliis.* Boccon. Mus. 119. Alpine Field Basil with Rose-like Heads, and Savory Leaves.

This 1st Sort grows naturally in Virginia; this is an annual Plant which has a four-cornered Stalk about 4 Inches high, sending out side Branches from the Bottom which stand opposite, these are terminated by a Cluster of small Flowers surrounded by oval Leaves, ending in acute Points. The Flowers have a slender cylindrical Empalement, out of which they just peep; they are purple, of the Lip Kind, and have but 2 Stamina; it flowers in June, July, and August, and the Seeds ripen about 6 Weeks after.

The 2d Sort grows naturally in the Levant; this sends up many slender ligneous Stalks, which rise near a Foot high, and are garnished with Spear-shaped Leaves, about the Size of those of Summer Savory, and have a Scent like those. The Flowers are produced in Whorls round the Stalks, which are like those of the former Sort, and appear at the same Season.

The Seeds of the third Sort I received from Dr. Ruffel, who procured them from Aleppo; this rises about 8 or 9 Inches high, the Stalks branch out their whole Length. The lower Leaves are narrow and hairy, those at the Top are oval, running out in acute Points. The Flowers are disposed in Whorls round the Stalks, and are like those of the former Sort. The whole Plant smells like Pennyroyal.

The 4th Sort grows naturally on the Alps, and Ap-

penine Mountains. The Stalks of this rise about 16 Inches high, and are garnished with small Spear-shaped Leaves placed opposite. The Flowers are produced in a Cluster, at the Top of the Stalks, which are of the same Shape and Colour, as those of the first Sort, and are surrounded with Spear-shaped Leaves.

These Plants are all of them annual, so are propagated only by Seeds.

The Seeds may be sown in a Border of light Earth, either in Spring or Autumn. Those Plants which come up in Autumn, will abide through the Winter, and will grow much larger than those which come up in the Spring; though neither of them rise very high. The Seeds should be sown where the Plants are to remain; for they do not thrive well when they are transplanted, unless the Earth remains to their Roots. These have a pretty strong, aromack Scent, somewhat resembling Summer Savory; but as they are Plants of little Beauty, they are seldom cultivated but in Botanick Gardens, for Variety.

The Seeds of those Plants which come up in Autumn, will be ripe in July or August; but those of the Spring Plants will not ripen till the latter End of August, or the Beginning of September, when if the Seeds are permitted to scatter, the Plants will come up, and require no farther Care, but to clear them from Weeds, and thin them where they are too close.

ZIZIPHUS. Tourn. Inst. R. H. 627. Tab. 403. *Rhamnus.* Lin. Gen. Pl. 235. The Jujube.

The Characters are,

The Flower has no Empalement; it has 1 Funnel-shaped Petal, which spreads open at the Top, and is cut into 4 or 5 Segments; it has 5 Awl-shaped Stamina, whose Bases are inserted to the Petal, and are terminated by small Summits, and an oval Germen supporting 2 slender Styles crowned by obtuse Stigmas. The Germen afterward becomes an oblong oval Berry, inclosing a single Nut of the same Form, which has 2 Cells, each containing an oblong Seed.

The Species are,

1. **ZIZIPHUS aculeis geminatis reſſis, foliis oblongo-ovatis serratis.** Jujube with strait Thorns growing by Pairs, and oblong, oval, sawed Leaves. This is the *Ziziphus*, Dad. p. 809. The common Jujube.

2. **ZIZIPHUS aculeis geminatis, altero recurvo, foliis ovatis nervosis.** Jujube with Twin Spines one of which is recurved, and oval veined Leaves. *Ziziphus fylvestris.* Tourn. Inst. 627. The Wild Jujube.

3. **ZIZIPHUS aculeis solitariis recurvis, pedunculis aggregatis, foliis cordato-rotundis nervosis, subtus tomentosis.** Jujube with single recurved Spines, Foot Stalks in Clusters, and round heart-shaped, veined Leaves downy on their under Side. *Jujube aculeata, nervosis foliis infra sericeis, flavis.* Burm. Zeyl. 131. Prickly Jujube with veined Leaves, which are silky and yellow on their under Side.

4. **ZIZIPHUS aculeis geminatis reſſis, foliis ovatis nervosis.** Jujube with double strait Thorns, and oval veined Leaves. *Jujube s. Zizyphus Africanus, mucronatis foliis, spinis gemellis.* Pluk. Alm. 199. African Jujube with pointed Leaves and double Spines.

The 1st Sort grows naturally in the warm Parts of Europe; it has a woody Stalk which divides into many crook-

crooked irregular Branches, which are armed with strong strait Thorns set by Pairs at each Joint. The Leaves are 2 Inches long and 1 broad, slightly sawed on their Edges, and stand on short Foot Stalks. The Flowers are produced on the Side of the Branches; two or three arising from the same Place which sit close; they are small and of a yellow Colour; these are succeeded by an oval Fruit, about the Size of a middling Plum, of a sweetish Taste and are clammy, including a hard oblong Stone, pointed at both Ends.

The Fruit of this Tree was formerly used in Medicine, it is reckoned pectoral, and good for Coughs, Pleurifies, and hot sharp Humours, but is now seldom to be found in the Shops. In Italy and Spain, this Fruit is served up at the Table in Desserts during the Winter Season, as a dry Sweetmeat.

The 2d Sort grows naturally about *Tinus* in Africa; this has slender woody Stalks, which send out many weak Branches, covered with a grayish Bark, and armed with Spines which come out by Pairs at each Joint, one of which is longer than the other, and is strait; the other is short and recurved. The Leaves are small, oval, and veined; they are half an Inch long, and as much in Breadth, sitting close to the Branches. The Flowers of this Sort I have not seen, so can give no farther Description of this Plant.

The 3d Sort grows naturally in India; this rises with shrubby Stalks 10 or 12 Feet high, sending out many slender Branches, which have a yellowish Bark, and are armed with single recurved Thorns at each Joint. The Leaves are round, Heart-shaped, about 2 Inches long, and as much in Breadth, and are indented at the Foot Stalk; they have 3 longitudinal Veins, and are covered with a yellowish Down on their under Side. The Flowers come out in Clusters from the Wings of the Branches; they are small and of a yellowish Colour, these are succeeded by oval Fruit about the Size of small Olives inclosing a Stone of the same Shape.

The 4th Sort grows naturally in Syria, from whence I have received the Seeds; this sends up several shrubby Stalks from the Root, which divide into slender Branches, these are armed with strait Spines, which are set by Pairs at each Joint. The Leaves are small, oval, and veined, and are placed alternate, standing on very short Foot Stalks. The Flowers are small, of a yellow Colour, arising at the Wings of the Branches. The Fruit is round, and about the Size of Stones.

These Plants are preserved only in the Gardens of some curious Persons for Variety, for they do not produce Fruit in England. The 1st and 4th Sorts, which are the most hardy, will scarce live through the Winters in England, even when they are planted against South Walls; in which Situation I have kept the Plants 2 or 3 Years, when the Winters have proved mild, but they were afterward killed by a sharp Frost. They may be propagated by putting their Stones into Pots of Fresh light Earth, soon after their Fruits are ripe; and in Winter they should be placed under a common hot Bed Frame, where they may be sheltered from severe Frost. In the Spring these Pots should be plunged into a moderate hot Bed, which will greatly forward the Growth of the Seeds; and when the Plants are come up, they should be aired to the open Air by Degrees, into

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which they must be removed in June, placing them near the Shelter of a Hedge; and in very dry Weather they must be frequently refreshed with Water.

In this Situation they may remain till the Beginning of October, when they must be removed either into the Green-house, or placed under a hot Bed Frame, where they may be defended from Frost, but should have as much free Air as possible in mild Weather.

During the Winter Season they should be now and then refreshed with Water; but after their Leaves are fallen (as they always shed them in Winter), they must not be over watered; which would rot the tender Fibres of their Roots, and cause the Plants to decay.

In March, just before the Plants begin to shoot, they should be transplanted, each into a separate small Pot filled with light fresh Earth; and if they are plunged into a moderate hot Bed, it will greatly promote their taking Root; but in May they must be inured to the open Air by Degrees, into which they should be soon after removed.

Thus these Plants should be managed while young, at which Time they are tender; but when they are 3 or 4 Years old, some of them may be planted in the full Ground, against a warm Wall or a Pale, where, if they have a dry Soil, they will endure the Cold of our ordinary Winters pretty well, but in hard Frosts they will require to be sheltered, so it will be proper to keep a Plant or two in Pots which may be housed in Winter.

These Plants may be also propagated by Suckers, which the old ones many Times send forth from their Roots, but these are seldom so well rooted as those produced from Seeds, nor do they make so good Plants, for which Reason they are but rarely propagated that Way.

The 2d Sort is not so hardy as the first, so these Plants must be kept in Pots, and in the Winter placed into the Green-house, and treated as other hardy exotick Plants, being careful not to over-water them at that Season, but especially when they have shed their Leaves.

This Sort is propagated by Seeds which must be procured from the Country where it naturally grows; these should be sown in Pots filled with light Earth, and plunged into a hot Bed of Tanners Bark, which will bring up the Plants in about six Weeks, if the Seeds are good. When the Plants begin to advance in Height, they should be gradually hardened, and in June they may be placed in the open Air in a sheltered Situation; but in Autumn they must be removed into Shelter, where they must remain all the Winter, and in the Spring, before the Plants begin to push out their Leaves, they should be carefully transplanted each into a separate small Pot, and plunged into a gentle hot Bed to forward their putting out new Roots. In Summer they must be exposed abroad, but in Winter they must be housed.

The 3d and 4th Sorts are tenderer than the former, so will not thrive in this Country unless the Plants are kept in a warm Stove. These are propagated as the former, but the Plants must be more tenderly treated, for they should not be wholly exposed abroad any Time in the Year; in Summer they must have a large Share of Air in warm Weather, and in Winter they must be kept in a warm Stove.

• ZYGOPHYLLUM. Lin. Gen. Pl. 474. *Fabago*. Tourn. Inst. R. H. 258. Tab. 135. Bean Caper.

The Characters are,

The Empalement of the Flower is composed of 5 oval obtuse Leaves. The Flower has 5 obtuse Petals longer than the Empalement, and indented at their Points; it has a closed Nectarium, which includes the Germen, composed of several Scales or little Leaves, to which the Bases of the Stamina are fastened; it hath 10 Awl-shaped Stamina, terminated by oblong Summits, and an oblong Germen, supporting an Awl-shaped Style, crowned by a single Stigma. The Germen afterwards becomes an oval five-cornered Capsule with 5 Cells, containing several roundish Seeds.

The Species are,

1. ZYGOPHYLLUM capsulis prismaticeo-pentandris. Hort. Upsal. 103. Bean Caper with a five-sided prismatical Capsule. *Fabago Belgarum sive peplus Parisiensium*. Lugd. 458. Common Bean Caper, or *Peplus* of the Parisians.

2. ZYGOPHYLLUM capsulis globoso-depressis. Lin. Sp. Pl. 385. Bean Caper with globular depressed Capsules. *Fabago Africana arborescens, flore sulphureo, fructu rotundo*. Com. Plant. rar. 10. Tree-like African Bean Caper with a Brimstone Flower and a round Fruit.

3. ZYGOPHYLLUM capsulaeum angulis compresso-membraneis. Lin. Sp. Pl. 385. Bean Caper with compressed membranaceous Angles to the Capsules. *Fabago tetraphylla flore terapetalo, fructu membranaceo quadrangulati*. Burm. Plant. Afr. 7. Four-leaved Bean Caper with a Flower of 4 Petals, and a 4 cornered membranaceous Fruit.

4. ZYGOPHYLLUM capsulis ovatis acutis. Lin. Sp. Pl. 386. Bean Caper with oval acute-pointed Capsules. *Fabago flore luteo, petalorum unguibus rubris, fructu sulcato acuto oblongo*. Burm. Plant. Afr. 6. Bean Caper with a yellow Flower, the Tails of the Petals red, and an acute, oblong, furrowed Fruit.

The 1st Sort grows naturally in Syria; this has been long an Inhabitant of some curious Gardens in England. The Root is thick, fleshy, and strikes deep into the Ground, and will grow as thick as a Man's Arm when old. The Stalks decay every Autumn to the Root, from which Spring new Shoots every Year, in Number proportional to the Size of the Root; they rise 3 or 4 Feet high, sending out a few Side Branches; these are smooth, green, and jointed; they are garnished with smooth fleshy Leaves like those of Purslane, 2 standing together on the same Foot Stalk which is an Inch long; they are of a blueish green Colour. The Flowers are produced from the Wings of the Stalk, 2 or 3 arising at the same Joint upon short Foot Stalks; they are composed of 5 roundish concave Petals of a reddish Colour on their Outside, and 10 Stamina which are twice the Length of the Petals. The Flowers are succeeded by oblong prismatical Capsules with 5 Sides, which have Cells filled with roundish Seeds. This Sort flowers in June and July, and the Seeds ripen in Autumn.

The 2d Sort grows naturally at the Cape of Good Hope; this rises with a thick woody Stalk, 3 or 4 Feet high, sending out many Branches, garnished with succulent Leaves placed by Fours sitting close to them. From the Wings of the Stalks the Flowers are produced on pretty long slender Foot Stalks; they are composed of

5 Sulphur-coloured Petals which have a brown Spot on each of their Tails; these are succeeded by roundish depressed Fruit having 5 Cells, each containing 2 roundish Seeds. This Plant continues flowering all Summer and Autumn, and the Seeds ripen in Winter.

The 3d Sort grows naturally at the Cape of Good Hope; this has a shrubby Stalk which divides into many irregular jointed Branches, which rise 4 or 5 Feet high, and are garnished with thick succulent Leaves, which are larger, and more obtuse than those of the second Sort; they are placed by Fours at each Joint, 2 on each Side the Stalk opposite. The Flowers come out from the Wings of the Stalk on slender Foot Stalks; these have but 4 Petals, which are broader than those of the second Sort, but of the same Colour, each having a brown Spot at their Tails. The Fruit has 4 broad membranaceous Wings to it, resembling the Sails of a Mill. This Plant flowers most Part of Summer, but the Fruit seldom ripens well in England.

The 4th Sort is a Native of the Cape of Good Hope; The Stalks of this branch out greatly from the Bottom; they are shrubby, jointed, and irregular. The Leaves are of the Consistence of those of Purslane; they are narrow at their Tails, but oval toward their Points, and are placed by Fours at each Joint like the former. The Flowers come out from the Wings of the Stalk on slender Foot Stalks; they are of a pale yellow Colour, each Petal having a pretty large red Spot at their Tails. The Fruit is oval, about 3 Quarters of an Inch long, having 5 deep Furrows, and is divided into 5 Cells filled with roundish Seeds. This Plant flowers great Part of the Year, and the Fruit ripens in Autumn and Winter.

The 1st Sort is propagated only by Seeds, which ripen very well in England in warm Seasons; these may be either sown on a moderate hot Bed, in the Spring, or on a warm Border of light Ground; those which are sown on the hot Bed will come up in three Weeks or a Month; and about a Month after, the Plants will be fit to remove, when they should be each planted in a separate small Pot filled with fresh light Earth, and plunged into a gentle hot Bed to promote their taking Root, and shaded from the Sun in the Day Time; afterward they must be gradually hardened to bear the open Air, to which they should be exposed all the Summer; but in Autumn, when their Stalks begin to decay, they should be placed in a hot Bed Frame to shelter them from the Frost in Winter, for while they are young, they are a little tender. The Spring following they may be turned out of the Pots, and planted in a South Border close to a Wall, in a dry rubbishy Soil, where they will endure the Cold without Covering. There is a Plant of this Kind in the Chelsea Garden which is near 50 Years old, and has resisted the severest Cold without any Covering, and produces great Plenty of Flowers and Fruit annually.

Those Plants which come up in the full Ground will require no other Care but to keep them clean from Weeds, and thin them where they come up too close, giving them Room to grow the first Year, and when their Stalks decay in Autumn, the Surface of the Ground should be covered with Tan to prevent the Frost from penetrating to the Roots, or in frosty Weather, they may be covered with Straw or Peas Haulm, which will answer the same Purpose; and in the Spring, the Roots should

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should be carefully taken up, planting them close to a warm Wall, as was before directed.

The other 3 Sorts are too tender to live through the Winter in the open Air in this Country, so they must be kept in Pots, and housed in Autumn. These Plants may be propagated either by Seeds or Cuttings.

The 2d and 4th Sorts ripen their Seeds pretty well in *England*, so may be propagated by sowing them on a moderate hot Bed in the Spring, and when the Plants are about an Inch high, they should be each transplanted into a small Pot filled with light Earth, and plunged into a moderate hot Bed, shading them from the Sun till they have taken new Root; then as the Season advances, they should be gradually hardened to bear the open Air, into which they should be removed the latter End of *May*, placing them in a warm sheltered Situation, where they may remain till Autumn, when they should be placed in an airy dry Glass Case, where they will succeed better than in a Green-house; for they require a

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large Share of Air in mild Weather, otherwise their Shoots are apt to be weak and tender, so are often injured by damp Air in Winter, but they do not require any artificial Heat. If they are screened from the Frost, and have Plenty of Air, they will thrive very well.

The 3d Sort seldom produces good Seeds in *England*, so is propagated by Cuttings, and the 2 others are generally increased in the Gardens the same Way, that Method being very expeditions, though the Seedling Plants grow stronger, and rise to a greater Height. These Cuttings may be planted in a Bed of light Earth during any of the Summer Months; if these are covered close down with Bell or Hand Glasses, and shaded from the Sun, they will put out Roots in five or six Weeks, and then they may be taken up carefully and potted, placing them in the Shade till they have taken new Root; after which they may be removed to a warm sheltered Situation, and treated as those Plants raised from Seeds.

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A C A T A -

A CATALOGUE of such hardy deciduous Trees and Shrubs as will thrive in the open Air in *England* without Shelter.

In this Catalogue we have only given the Generical Title of each Tree or Shrub, and added the Numbers as they are marked in the Body of the Work to the several Species, so that they may be readily turned to. To the *Latin* Titles are added the common *English* Names, which may answer the Expectations of our Readers full as well as if they were inserted at Length to each Species.

We have also reduced them into one List, and not disposed them in several, according to their different Growths, as they were in the former Editions of the *Gardeners Dictionary*, but have marked them with the following Letters, ABCD. Those marked A are such as grow more than forty Feet high; those marked B are such as grow from twenty to forty Feet; those marked C rise from ten to twenty-five, and such as are marked D are Shrubs of lower Growth. To such as produce Flowers for Ornament or Scent, and are worthy of the Pleasure Garden, is added the Letter F, whereby every Person will be capable of selecting such Trees and Shrubs as are proper for their different Purposes.

It is not proposed to insert in this List any of the Undershrubs, which are of short Duration, such as *Southernwood*, *Rosemary*, *Lavender*, *Lavender-cotton*, &c. because whenever these decay, they occasion Gaps in the Plantation.

A CER, 1. *Sycamore*, A
 Acer, 2. *Maple*, C
 Acer, 3. *Ash-leaved Maple*, A
 Acer, 4. *Norway Maple*, B
 Acer, 5. *Flowering Maple*, CF
 Acer, 6. *Sugar Maple*, B
 Acer, 7. *Mountain Maple*, C
 Acer, 8. *Italian Maple*, A
 Acer, 9. *Montpelier Maple*, C
 Acer, 10. *Eastern Maple*, C
 Acer, 11. *Oval-leaved Maple*, D
 Æsculus, *Horse Chestnut*, AF
 Alnus, 1. *Common Alder*, B
 Alnus, 2. *Long-leaved Alder*, B
 Alnus, 3. *Dwarf Alder*, D
 Amorpha, *Bastard Indigo*, DF
 Amygdalus, 1. *Almond Tree*, CF
 Amygdalus, 5. *Dwarf Almond*, DF
 Andromeda, 2, 3, 5. D
 Annona, 8. *Papaw*, C
 Aralia, 3. *Angelica Tree*, D

B.
 Bacteria, *Allspice*, DF
 Berberis, 1. *Barberry*, D
 Betula, 1. *Birch Tree*, B
 Bignonia, 3. *Catalpa*, CF
 Vol. II.

C.
 Carpinus, 1. *Hornbeam*, A
 Carpinus, 2, 3, 4. *Hop Hornbeam*, C
 Castanea, 1. *Cassioberry Bush*, D
 Castanea, 2. *Cinquapin*, D
 Ceanothus, 1. *Ferrey Tea*, DF
 Celtis, 1, 2. *Nettle Tree*, B
 Celtis, 3, 4. C
 Cephalanthus, *Button Tree*, D
 Cerasus, *Double-flowering Cherry*, CF
 Cerasus, 4. *Perfumed Cherry*, D
 Cerasus, 5. *Dwarf Cherry*, DF
 Cercis, 1, 2. *Judas Tree*, CF
 Chionanthus, *Snowdrop Tree*, CF
 Clethra, DF
 Colutea, 1. *Bladder Sena*, CF
 Colutea, 2, 3. *Bladder Sena*, DF
 Coriarea, *Myrtle-leaved Sumach*, D
 Cornus, 1, 2, 3, 4, 5, 6. *Dogwood*, C
 Cornus, 7. D
 Corylus, 1, 2, 3. *Nut Tree*, C
 Cratægus, 1, 2. B
 Cratægus, 3, 4. D
 Cupressus, 4. *American deciduous Cypress*, A
 Cydonia, *Quince Tree*, C

Cytisus, 1, 2. *Labiurnum*, BF
 Cytisus, 3, 5, 12. DF

D.
 Daphne, 2, 5, 7, 8. *Mezerion*, DF
 Diervilla, D
 Diospyrus, 1, 2. *Date Plum*, C

E.
 Elæagnus, 1, 2. *Wild Olive*, C
 Emerus, 1, 2. *Scorpion Sena*, DF
 Euonymus, 1, 2. *Spindle Tree*, C

F.
 Fagus, *Beech Tree*, A
 Frangula, 1, 2. *Berry-bearing Alder*, D
 Fraxinus, 1, 4. *Ash Tree*, A
 Fraxinus, 2, 3, 5, 6. *Ash*, B

G.
 Gleditsia, 1, 2. *Three-thorned Acacia*, C

H.
 Hamamelis, *Witch Hazel*, D
 Hibiscus, 1. *Althæa Frutex*, DF
 Hippophae, 1, 2. *Sea Buckthorn*, C
 Hydrangea, D

A CATALOGUE OF PLANTS.

Hypericum, 3, 4, 6. *St. John's Wort*,
D F

Orobus, 10. *Caragana*, C F

Rubus, 5, 6. *Bramble*, C F

I.
Johnsonia, D
Itea, D F
Juglans, 1, 2, 3. *Walnut*, A
Juglans, 4, 5, 6. *Hickory Nut*, B

L.
Larix, 1. *Larch Tree*, A
Laurus, 6, 7, 8. C
Ligustrum, 1. *Privet*, C
Liquid Amber, 1, 2. B
Lonicera, 1, 2, 3, 4, 5, 6, 7. *Upright
Honeysuckle*, C F

M.
Magnolia, 1. *Sweet Bay*, C F 3, 4,
B F
Mespilus, 3, 4, 5, 7, 8, 9, 10, 12.
13, 14, 15, 16. *Medlar*, B F
Mespilus, 17, 18, 19, 20, 21, 22. C F
Morus, 6. *Mulberry*, B
Myrica, 1, 2, 3, 4. *Candleberry*, C

O.
Ononis, 5. *Rest-barrow*, C F

P.
Badus, 1. *Bird Cherry*, C F 2, 3. B F
Paliurus, *Christ's Thorn*, C
Pavia, *Scarlet Horse Chestnut*, C F
Periclymenum, 5, 6, 7. *Honeysuckle*,
C F
Persica, 1. *Peach*, B F 2, 3, C F
Philadelphus, 1, 2, 3. *Syringa*, C F
Pistacia, 1, 4. C
Platanus, 1, 2. *Plane Tree*, A
Populus, 1, 2, 3, 4, 5, 6. *Poplar*, A
Prinos, 1, 2. C
Ptelea, 1. *Trefoil Shrub*, C

Q.
Quercus, 1, 2, 5, 9, 13. *Oak*, A
Quercus, 7, 8, 11, 12, 14, 15, B

R.
Rhamnus, 1, 2, 3. *Buckthorn*, C
Rhododendron, 1, 2. *Rose Laurel*, C
Rhus, 1, 2, 3, 4, 5, 6. *Sumach*,
C F
Robinia, 1, 2. A F 3, 10. *Acacia*,
C F
Rosa, all the Sorts. *Rose*, C F

S.
Salix, 1, 2, 3. A 5, 6, 7, 8, 9, 10,
11. *Sallow*, B
Sambucus, 1. B 2, 3. *Elder*, C
Sorbis, 1, 2. *Service*, B
Spartium, 1, 2, 3. *Broom*, C F
Spiraea, 1, 2, 3, 6, 7, 8. C F
Staphylaea, 1, 2. *Bladder Nut*, C
Stewartia, C F
Syringa, 1. *Lilac*, B 2, 3. C F

T.
Tacamahacca, B
Tamarix, 1. *Tamarisk*, B 2. C
Tilia, 1, 2. *Lime Tree*, A 3, 4. B
Toxicodendron, 2, 3, 4, 5. *Poison
Oak*, C
Tulipifera. *Tulip Tree*, A F

V.
Viburnum, 1, 2, 3, 4. *Way-faring
Tree*, C F
Vitex, 1, 2. *Chaste Tree*, C
Ulmus, 1, 2, 3, 4. *Elm*, A 5. B

A List of climbing shrubby Plants, whose Branches must be supported to prevent their trailing upon the Ground, which should be fastened to Walls, Pales, or Trellisses.

Bignonia, 1, 2, 5, 6, 8. *Trumpet
Flower*.
Ceanothus, 2.
Clematis, 4, 5, 6, 7, 8, 9, 10, 11, 12,
Traveler's Joy.
Glycine, 2. *Kidney-bean Tree*.
Hedera, 1. *Ivy*

Jasminum, 1. *Jasmine*.
Lycium, 6, 7. *Boxthorn*.
Menispermum, 1, 2, 3. *Moonseed*.
Mespilus, 6. *Medlar*.
Passiflora, 2. *Passion Flower*.
Periclymenum, 1, 2, 5, 6, 7, 18.
Honeysuckle.

Periploca, 1. *Virginia Silk*.
Rosa, 8, 9. *Rose*.
Smilax, 1, 2, 3, 4, 9, 11. *Rough
Bindweed*.
Solanum, 8. *Nightshade*.
Toxicodendron, 2, 6. *Poison Oak*.
Vitis, 1, 5. *Vine*.

A Catalogue of hardy ever-green Trees and Shrubs. Those marked with A are such as grow more than forty Feet high; those with B are such as grow from twenty to forty Feet high; those with C grow from ten to twenty Feet, and those marked with D are low Shrubs.

A Bies, 1, 2, 3, 4, 5. *Fir Tree*,
A 6, 7, 8, 9. B
Alaternus, 2, 3, 4. C
Arbutus, 1, 2. *Strawberry*, C
Bupleurum, 6. *Hares Ear*, D
Buxus, 1, 2. *Box*, C 3. D
Celastrus, 1. *Staff Tree*, D
Cistus, 1, 2, 3, 4, 5, 6, 7, 8, 9,
12, 13, 14, 15, 16. *Rock Rose*, D
Cneorum. *Widow-wail*, D
Cupressus, 1, 2. *Cypress*, B 3. C 5. D
Cytisus, 6. *Trefoil Tree*, D
Daphne, 1, 4. *Mezereon*, D

Euonymus, 3. *Spindle Tree*, D
Hedera, *Ivy*, D
Hypericum, 3, 4, 6. *St. John's Wort*,
D
Ilex, 1. *Holly*, B 2, 3. C
Juniperus, 1, 10, 11. *Juniper*, D 2,
3, 4, 5, 6. C 7, 8, 12, 13. B
Kalmia, 1, 2, 3. *Rose Laurel*, D
Larix, 3. *Cedar of Lebanon*, A
Laurus, 1, 2. *Bay Tree*, B
Ligustrum, 2. *Privet*, C
Magnolia, 2. *Laurel-leaved Tulip
Tree*, C

Medica, 8. *Moon Trefoil*, D
Mespilus, 6. *Pyracantha*, C
Padus, 4, 5, 6. *Laurel*, C
Periclymenum, 1, 8. *Honeysuckle*, D
Phillyrea, 1, 2, 3. C 4, 5, 6, 7. D
Pinus, 1, 3, 5, 10, 13. *Pine Tree*,
A 2, 4, 6, 7, 11. B 8, 9, 14. C
Quercus, 3, 16. *Oak*, A 17, 20. B
19. C 18
Rosa, 8, 9. *Rose*, D
Taxus. *Yew*, B
Thuya, 1, 2. *Tree of Life*, C
Viburnum, 5, 6. *Laurus tinus*, D

A CATALOGUE OF PLANTS.

A Catalogue of hardy perennial Plants, which will thrive in the open Borders without any Shelter, whose Roots do not require to be every Year taken out of the Ground; these are such as have ornamental Flowers, and are proper Furniture for the Flower Garden.

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|---|--|--|
| <p>A Conitum, 1, 2, 3, 4, 5, 7, 8, 9, 10. <i>Wolfsbane</i>.
 Adonis, 3. <i>Pheasant Eye</i>.
 Anthemis, 16, 17. <i>Camomile</i>.
 Anthericum, 1, 3. <i>Spiderwort</i>.
 Antirrhinum, 3, 4, 5. <i>Snapdragon</i>.
 Apocynum, 3. <i>Dogbane</i>.
 Aquilegia, 1, 2, 3, 4. <i>Columbine</i>.
 Asclepias, 6, 9, 10, 11. <i>Swallow Wort</i>.
 Asphodelus, 1, 2, 3, 4. <i>Kings Spear</i>.
 Aster, 1, 2, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29. <i>Starwort</i>.
 Bellis, 3. <i>Daisy</i>.
 Chelone, 1, 2, 3.
 Coreopsis, 4. <i>Tickseed</i>.
 Cyclamen, 1, 2. <i>Sowbread</i>.
 Delphinium, 5, 6, 7, 9. <i>Larkspur</i>.
 Dianthus, 1, 4. <i>Gilliflower</i>.
 Dictamnus, <i>Fraxinella</i>.
 Eryngium, 4, 5, 6. <i>Sea Holly</i>.</p> | <p>Fumaria, 3, 7, 8. <i>Fumitory</i>.
 Gentiana, 1, 2, 4. <i>Gentian</i>.
 Helianthus, 2. <i>Sunflower</i>.
 Helleborus, 3, 4, 5, 6. <i>Hellebore</i>.
 Hemerocallis, 1, 2, 4. <i>Day Lily</i>.
 Hesperis, 1, 2, 4. <i>Rocket, or Dame's Violet</i>.
 Hibiscus, 18. <i>Indian Mallow</i>.
 Hieracium, 3. <i>Hawweed</i>.
 Iberis, 2. <i>Candy Tuft</i>.
 Inula, 3, 6, 10. <i>Yellow Starwort</i>.
 Iris, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 16, 17, 18, 19. <i>Flower-de-luce</i>.
 Ixia, 1.
 Lathyrus, 15, 16. <i>Everlasting Pea</i>.
 Lupinus, 6. <i>Lupine</i>.
 Lychnis, 1, 2, 3, 4, 5. <i>with double Flowers</i>.
 Meadia,
 Monarda, 1, 2. <i>Oswego Tea</i>.
 Ononis, 6, 15. <i>Rest-barren</i>.
 Orobis, 4, 7, 8. <i>Bitter Vetch</i>.</p> | <p>Paeonia, <i>all the Varieties Piony</i>.
 Papaver, 7. <i>Poppy</i>.
 Phlox, 2, 3, 4, 5, 6, 7. <i>Lychnidea</i>.
 Pulmonaria, 3, 6. <i>Lungwort</i>.
 Pulsatilla, <i>all the Species Pasque-Flower</i>.
 Rudbeckia, 1, 2, 4, 5, 6. <i>Dwarf Sunflower</i>.
 Solidago, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31. <i>Golden Rod</i>.
 Thalictrum, 3, 5. <i>Feathered Columbine</i>.
 Trachelium. <i>Throatwort</i>.
 Trollius, 1, 2. <i>Goldlocks</i>.
 Veratrum, 1, 2, 3, 4. <i>White Hellebore</i>.
 Verbascum, 10. <i>Mullein</i>.
 Veronica, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14. <i>Speedwell</i>.</p> |
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A List of such Plants as will thrive under the Shade of deciduous Trees, therefore are proper Furniture for Wilderness Quarters.

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|---|---|---|
| <p>A Canthus, 1, 2, 3, 4, 5. <i>Bear-breech</i>.
 Aconitum, 6. <i>Wolfsbane</i>.
 Actæa, 1, 2, 3. <i>Herb Christopher</i>.
 Anemone, 1, 2, 3. <i>Anemomy</i></p> | <p>Aralia, 1, 2.
 Convallaria, <i>all the Species Lily of the Valley</i>.
 Geum, 1, 2, 3, 4, 5. <i>London Pride</i>.
 Hemerocallis, 3. <i>St. Bruno's Lily</i>.</p> | <p>Hypericum, 7. <i>St. John's Wort</i>.
 Primula, <i>all the Varieties Primrose</i>.
 Vinca, 1, 2. <i>Pewinckle</i>.
 Viola, 1, 2. <i>with their Varieties Violet</i>.</p> |
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A Catalogue of Plants which are too tender to live abroad in Winter in England, but require no artificial Heat; these are commonly called Green-house Plants, but those whose Leaves and Stalks are succulent, will succeed better if they are kept in a dry airy Glass Case in Winter, where they may enjoy the Sun and Air at all Times when the Weather is mild.

- | | | |
|---|--|--|
| <p>A Gave, 1, 2, 7. <i>Aloe</i>.
 Aizoon, 1. <i>Ever green</i>.
 Aloe, 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, <i>Aloe</i>.
 Anthericum, 4, 5, 6, 7, 8, 9. <i>Spiderwort</i>.
 Antholyza, 1, 2.
 Anthospermum
 Anthyllis, 6, 7. <i>Jupiter's Beard</i>.
 Arctotis, 2, 3, 4, 5, 6, 7, 8. <i>Wind Seed</i>.
 Aristolochia, 4, 5. <i>Birthwort</i>.
 Asclepias, 12, 13, 14, 15. <i>Swallow Wort</i>.
 Asparagus, 5, 6, 7, 8, 9, 10. <i>Asparagus</i>.
 Asphodelus, 6. <i>Kings Spear</i>.
 Aster, 31, 32, 37. <i>Starwort</i>.
 Aurantium, 1, 2, 3, 4, 5. <i>Orange</i>.</p> | <p>Baccharis, 1. <i>Ploughman's Spikenard</i>.
 Bignonia, 5, 12. <i>Trumpet Flower</i>.
 Bosia
 Brabejum
 Bubon, 3, 4. <i>Macedonian Parsley</i>.
 Buphthalmum, 7, 10, 11, 12. <i>Ox Eye</i>.
 Bupleurum, 7. <i>Hares Ear</i>.
 Cacalia, 5, 6, 7, 8. <i>Foreign Colts-foot</i>.
 Calendula, 7, 8. <i>Marygold</i>.
 Calla, <i>Arum</i>.
 Campanula, 14, 15. <i>Bell Flower</i>.
 Capparis, 1, 2. <i>Caper</i>.
 Celastrus, 3, 4. <i>Staff Tree</i>.
 Ceratonia, <i>St. John's Bread</i>.
 Cereus, 11. <i>Torch Thistle</i>.
 Chironia, 1, 2.
 Chrysocoma, 3, 4. <i>Goldlocks</i>.
 Cistus, 10, 11, 17, 18. <i>Rock Rose</i>.
 Cliffortia, 1, 2, 3.</p> | <p>Clusia, 1, 2, 3.
 Convolvulus, 16, 22, 27. <i>Bindweed</i>.
 Coronilla, 1, 2. <i>Jointed podded Colutea</i>.
 Cotyledon, 4, 5, 6, 7, 8, 9. <i>Nave-wort</i>.
 Crassula, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.
 Cunonia
 Cupressus, 6. <i>Cypress</i>.
 Cyclamen, 3, 4, 5, 6. <i>Sowbread</i>.
 Cytisus, 4, 14, 15. <i>Tree Trefoil</i>.
 Diosma, 1, 2, 3, 4.
 Ebenus, <i>Ebony</i>.
 Euphorbia, 6, 7, 10, 12, 13, 16.
 Ferrara
 Galenia
 Geranium, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 43. <i>Crane's Bill</i>.
 Gnapha-</p> |
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A CATALOGUE OF PLANTS.

- Gnaphalium, 10, 16, 18, 20, 21. *Cudweed.*
 Græwia, 1, 2.
 Guajacum, 3.
 Halleria
 Heliotropium, 4, 5, 6. *Heliotrope*
 Hermannia, *all the Species.*
 Hypericum, 8. *St. John's Wort.*
 Jasminum, 5, 6. *Jasmine.*
 Iberis, 1. *Candy Tuft.*
 Inula, 12. *Yellow Starwort.*
 Justicia, 4.
 Ixia, 2, 3, 4, 5, 6, 7, 8.
 Kiggelaria
 Laurus, 3, 4, 5, 9. *Bay.*
 Leonurus, 1, 2. *Lions Tail.*
 Limon, *all the Varieties.* *Lemon.*
 Lotus, 5, 16. *Bird's Foot Trefoil.*
 Lycium, 1, 2, 3, 4, 7, 8, 9, 10. *Boxthorn.*
 Malva, 14. *Mallow.*
 Medeola, 1, 2, 3.
 Melia, 1, 2. *Bead Tree.*
 Mesembrianthemum, *all the Species.*
Ficoides.
 Myrica, 5, 6, 7. *Candleberry Myrtle.*
 Myrtus, 1, 2, 3, 4, 5, 6, 7. *Myrtle.*
 Nerium, 1, 2, 3. *Oleander.*
 Olea, 1, 2, 3, 4, 5. *Olive.*
 Ononis, 4. *Rest-barrow.*
 Opuntia, 1. *Indian Fig.*
 Oestrospermum, 2, 3, 4, 5. *Hard-seeded Sunflower.*
 Othonna, 3, 4, 5, 7, 8, 9. *Jacobæa.*
 Oxalis, 4, 5, 6. *Wood Sorrel.*
 Palma, 1, 8. *Palm.*
 Passerina, 1, 2, 3, 4.
 Periploca, 2, 7. *Virginia Silk.*
 Phyllis, 1, 2.
 Phyllis
 Physalis, 2, 3, 4. *Winter Cherry.*
 Pistacia, 3, 4, 5.
 Poterium, 3.
 Protea, *all the Species.* *Silver Tree.*
 Pforalea, 1, 10.
 Rhus, 8, 9, 10, 11, 12. *Sumach.*
 Royena, 1, 2, 3.
 Ruscus, 7. *Butchers Broom.*
 Salvia, 10, 11, 12. *Sage.*
 Scabiosa, 17, 18. *Scabious.*
 Schinus, 1. *Indian Masticb.*
 Sclarea, 15, 16. *Clary.*
 Selago
 Sempervivum, 5, 6, 7. *Houseleek.*
 Sideroxylum, 1, 2. *Iron Wood.*
 Smilax, 15, 16. *Rough Bindweed.*
 Solanum, 9, 11, 12, 13, 14, 25, 26, 28. *Nightshade.*
 Spartium, 4, 10. *Broom.*
 Stapelia, 1, 2.
 Tarconanthus,
 Tetragonia, 1, 2, 3.
 Teucrium, 3, 4. *Germander.*
 Vitex, 3. *Chaste Tree.*
 Wackendorfia.
 Watfonia.

A CATA-

A CATALOGUE of Plants, which will not thrive in this Country without artificial Heat in Winter; those which are marked with A are such as are most tender, so should be placed in the Bark Stove, and those marked B are such as will succeed in a moderate Warmth.

- A**CACIA, 1, 2, 3, 4, 11, 22. B 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21. *Egyptian Thorn*, A
 Achyranthes, 1, 2, 3, 4, B
 Adansonia, A
 Adenanthera, A
 Æschynomene, 1, 3, 4. *Sensitive Plant*, A
 Agave, 3, 4, 5, 6, 8. *Aloe*, B
 Aloe, 2, 7, 22, 24. B
 Alpinia, A
 Amaryllis, 5, 7, 8, 11. *Lily Daffodil*, B
 Amomum, 1, 2, 3. *Ginger*, A
 Anacardium. *Cashew Nut*, A
 Ananas, *Pine Apple*, A
 Andrachne, 3, 4, 5. A
 Apocynum, 4, 5, 6, 7, 8, 9, 10, 11. *Dogbane*, B
 Aristolochia, 8, 9, 10, 11, 12, 13. *Birthwort*, B
 Arum, 10, 11, 13, 14, 15, 16, 17, 18, 19. *Wake Robin*, A
 Arundo, 4, 5. *Reed*, A
 Asclepias, 17, 18, 19, 20. *Swallowwort*, B
 Banisteria, 1, 2, 3, 4, 5, 6, 7. A
 Barleria, 1, 2, 3. A. 4. B
 Bartramia, A
 Bauhinia, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. A
 Bessleria, 1, 2, 3. A
 Bignonia, 4, 9, 10, 11, 13, 14, 15, *Trumpet Flower*, A
 Bixa, A
 Bocconia, A
 Bombax, 1, 2. *Cotton*, A
 Bontia. *Wild Olive*, B
 Breynia, 1, 2. A
 Bromelia, 1, 2. A
 Brunfelsia, A
 Buddlejia, 1, 2. A
 Cacao. *Cocoa*, A
 Cactus, 1, 2, 3, 4. *Melon Thistle*, A 5, 6. B
 Cæsalpinia, 1, 2. A
 Cameraria, 1, 2. A
 Canna, 2, 3, 4, 5. *Flowering Reed*, B
 Capparis, 3, 4, 5, 6, 7, 8, 9, 10. *Caper*, B
 Capsicum, 7, 8, 9, 10. *Guiney Pepper*, B
 Carica, 1, 2. *Papaw*, A
 Cariophyllus, 1. *Cloves*, A. 2, 3, 4, 5. B
 Cassia, 2, 3, 4, 8, 10, 11, 13, 17. A
 Catebæa, A
 Cedrus, 1, 2, 3. *Mahogany*, B
 Celastrus, 5. *Staff Tree*, B
 Cerbera, 1, 2, 3. A
 Cereus, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. *Torch Thistle*, B
 Cestrum, 1, 2, 3, 4, 5, 6. B
 Chamærops, 1, 2. B
 Chrysobalanus, 1, 2. A
 Chrysophyllum, 1, 2. A
 Citharexylon, 1, 2. *Fiddle Wood*, B
 Clusia, 1, 2. A
 Clusia, 4. B
 Coccolobus. *Sea Side Grape*, A
 Coffea. *Coffee*, A
 Collococcus, A
 Columnia, A
 Colutea, 5. *Bladder Sena*, B
 Commelina, 3
 Conocarpus, 1, 2. *Buttonwood*, B
 Convolvulus, 14, 19, 31, 32. *Bindweed*, A
 Conyza, 5, 7, 9, 11, 12, 13. *Fleabane*, B
 Copaiba, A
 Cordia, A
 Cornutia, A
 Coronilla, 7. A
 Costus, A
 Cotyledon, 10. *Navelwort*, B
 Crateva, 1, 2. A C
 Crescentia, 1, 2. A
 Crinum, 1, 2, 3, 4. *Lily Hyacinth*, B
 Croton, 6, 7, 8, 9, 12. A
 Curcuma, 1, 2. A
 Cynanchum, 4, 6. B
 Cytisus, 16. *Base Trefoil*, B
 Datura, 7. *Thorn Apple*, B
 Douglassia, A
 Dracontium, 2, 3, 4, 5. *Dragon*, A
 Durandia, 1, 2, 3. A
 Elæagnus, 3. B
 Ellissea, B
 Emerus, 3. B
 Eretia, A
 Eryngium, 10. *Sea Holly*, A
 Erythrina, 1, 2, 3, 4, 5, 6. *Coral Tree*, B
 Euonymus, 4. *Spindle Tree*, B
 Eupatorium, 6, 10, 11, 14, B
 Euphorbia, 1, 2, 3, 4, 5, 8, 9, 14, 15, 17. *Spurge*, B
 Fuchsia, B
 Garcinia. *Mangosteen*, A
 Gesnera, 1, 2. A
 Gnaphalium, 17, 24. *Cudweed*, B
 Gossipium, 3, 4. *Cotton Tree*, A
 Guajacum, 1, 2. *Lignum Vitæ*, A
 Guilandina, 2, 4. 1, A
 Hæmanthus, 1, 2. *Blood Flower*, B
 Hæmatoxylum. *Logwood*, A
 Hedyfarum, 6, 7, 8, 16, 18. B
 Helicteres, 1, 2, 3. *Screw Tree*, A C
 Heliotropium, 8, 9, 11. *Turnsole*, B
 Hernandia. *Jack in a Box*, A
 Hibiscus, 5, 6, 7, 13, 23. *Marsh Mallow*, B
 Hippocratea, A
 Hippomane, 1, 2, 3. *Mangneel*, A
 Jasminum, 7. *Jasmine*, A
 Iatropha, 1, 2, 3, 4, 5, 6, 7, 8. A
 Inga, 1, 2. A
 Justicia, 1, 3, 6, 7, 8, A. 5, B
 Karatas. *Penguin*, A
 Kæmpheria, A
 Lantana, all the Species. *Viburnum*, B
 Laurus, 10. *Bay*, B
 Lawsonia, 1, 2. B
 Lippia, B
 Loranthus, B
 Malpighia, all the Species. *Cherry*, B
 Mamea, A
 Maranta, 1, 2. *Arrow Root*.
 Melastoma, all the Species. B
 Mimosa, 4, 5, 6, 7, 8, 9. A
 Muntingia, 1, 2, 3. B
 Musa, 1. *Plantain Tree*, A
 Myr-

CATALOGUE OF PLANTS.

- Myrtus, 8, 9. *Myrtle*, B
 Nyctanthes, 1, 2. *Arabian Jasmine*, A
 Opuntia, 2, 3, 4, 5, 6, 7, 8. *Indian Fig*. B 9. A
 Orobis, 11, 12. *Bitter Vetch*, B
 Oxalis, 7. *Wood Sorrel*, B
 Palma, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14. *Palm Tree*, A. 19. B.
 Pancratiun, 3, 4, 5, 6, 7, 8, 9. *Sea Daffodil*, A
 Parkinſonia. *Jeruſalem Thorn*, B
 Paſſiflora, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19. *Paſſion Flower*, A
 Paullinia, all the Species. B
 Pereskia. B
 Periclymenum, 2, 3, 4. *Honeysuckle*. A
 Periploca, 3, 4, 5, 6. *Indian Silk*, B
 Perſea. *Avocado Pear*, B
 Petrea. A
 Phyllanthus. B
 Phyſalis, 6, 9. *Winter Cherry*, B
 Piercea, 1, 2. B
 Piper, 3, 4, 5, 6, 7, 8, 8, 10, 11, 12, 14. A
 Piſonia. *Fingrigo*, B
 Piſtacia, 7, 8. *Piſtacia Nut*, A. 9. B
 Plumbago, 2. *Leadwort*, B
 Plumeria, 1, 2, 3, 4, 5.
 Poinciana. *Flower Fence*, A
 Pforalea, 3, 6, 8. B
 Ptelea, 2. *Trefoil Shrub*, B
 Randia. A
 Rhus, 14. *Stamach*, B
 Rivinia, 1, 2. *Currants*, A
 Robinia, 4, 5, 6, 7, 8, 9. *False Acacia*, B
 Rondeletia, 1, 2. A
 Ruellia, 1, 2, 3, 4. *Snap Graſs*, A
 Saccharum. *Sugar Cane*, A
 Samida, 1, 2. B
 Sapindus. *Sepeberry*, B
 Sapota, 1, 2. A
 Schinus, 2. *Indian Maſticb*, A
 Sicyos, 3. A
 Sifyrinchium, 3. *Earth Nut*, A
 Smilax, 12, 13, 14. *Rough Bindweed*, B
 Solanum, 10, 17, 18, 19, 20, 21, 22, 23, 24, 27, 29, 30, 31, 32, 33. *Nightſhade*, B
 Sophora, 2. A
 Spartium, 11. *Broom*, B
 Suriana. A
 Tabernemontana, 1, 2. A
 Tamarindus. *Tamarifk*, A
 Tetracera. A
 Teucrium, 18, 19. *Germander*, B
 Theobroma. *Baſtard Cedar*, A
 Tithymalus. *Spurge*, B
 Toluifera. A
 Tournefortia, 1, 2, 3, 4, 5, 6. A
 Toxicodendron, 8, 9. *Poiſon Oak*, B
 Turnera, 1, 2. A
 Vanilla, 1, 2. A
 Vinca, 3. *Periwinkle*, B
 Urtica, 9. *Nettle*, B
 Waltheria, 1, 2. A



A CATA.

A CATALOGUE of such Medicinal Plants as may be cultivated in the *English* Gardens, being hardy enough to bear the Cold in the open Air. Such of them as grow in the Fields, and are generally termed *Weeds*, are also distinguished with their Places of Growth, so that any Person, who is inclinable to cultivate them, may know where to obtain them. The Titles of these Plants are such as have been adopted in the Dispensaries, and the Figures, which are added to them, denote the Species in the Body of this Work.

- A** Brotanum mas angustifolium majus. C. B. P. *Southerwood*. Sp. 1.
 Absinthium vulgare majus. J. B. *Common Wormwood*. English, *In Lanes, and on Dungbills*. Sp. 1.
 Absinthium Ponticum tenuifolium incanum. C. B. P. *Roman Wormwood*. Sp. 2.
 Absinthium maritimum album, Ger. *Sea Wormwood*. English, *On the Sea Shore*. Sp. 13.
 Acanthus fativus vel mollis Virgilii, C. B. P. *Bears-breech*. Sp. 1.
 Acetosa pratensis. C. B. P. *Common Sorrel*. English, *In Meadows, and other Pastures*. Sp. 1.
 Acetosa arvensis lanceolata. C. B. P. *Sheeps Sorrel*. English, *On dry gravelly Soils*. Sp. 3.
 Acetosa rotundifolia hortensis. C. B. P. *French Sorrel*. Sp. 4.
 Acorus verus, five Calamus Aromaticus officinarum, C. B. P. *The true Acorus*. English, *In deep standing Waters, but pretty rare*. Sp. 1.
 Adiantum foliis longioribus pulverulentis pediculo nigro. C. B. P. *Black Maiden Hair*. English, *In Joists of old Walls, and on the Sides of shady Banks*.
 Adiantum foliis coriandri. C. B. P. *The true Maiden Hair*. Sp. 1.
 Ageratum foliis ferratis. C. B. P. *Sweet Maudlin*.
 Achillea, Sp. 8.
 Agrimonia officinarum. Inst. R. H. *Agrimony*. English, *In Woods and shady Lanes*.
 Alcea vulgaris major. C. B. P. *Vervain Mallow*. English, *In Pastures*. Malva.
 Alchimilla vulgaris. C. B. P. *Ladies Mantle*. English, *In moist Pastures*. Sp. 1.
 Alkekengi officinarum. Inst. R. H. *Winter Cherry*. Physalis, Sp. 1.
 Allium fativum. C. B. P. *Garlick*. Sp. 1.
 Alsine media. C. B. P. *Cbickweed*. English, *In every Dungbill, and in every Garden*.
 Althæa Dioscoridis & Plinii. C. B. P. *Marsh Malw*. English, *In moist Lanes in Kent*.
 Amaranthus maximus. C. B. P. *Flower Gentle*. Sp. 3.
 Ammi majus. C. B. P. *Bishops Weed*. Sp. 1.
 Anagallis phœniceo flore. C. B. P. *Pimpernel*. English, *On ploughed Lands*. Sp. 1.
 Anagallis cœruleo flore. C. B. P. *The female Pimpernel*. English, *On ploughed Lands, but pretty rare*. Sp. 2.
 Anchusa puniceis floribus, C. B. P. *Alkanet*. Lythospermum.
 Anethum hortense. C. B. P. *Dill*. Sp. 1.
 Angelica fativa. C. B. P. *Angelica*. Sp. 1.
 Anonis spinosa, flore purpureo. C. B. P. *Rest-barrow*. English, *On Commons, and in other uncultivated Places*.
 Ononis, Sp. 1.
 Anthora, seu Aconitum salutiferum. C. B. P. *Wholesome Monk's-hood*. Aconitum, Sp. 4.
 Aparine vulgaris. C. B. P. *Clivers, or Goose-grass*. English, *Under Hedges, &c.*
 Apium palustre, & Apium officinarum. C. B. P. *Smallage*. English, *In standing Waters*. Sp. 4.
 Apium hortense. Ger. *Garden Parsley*. Sp. 1.
 Apium Macedonicum. C. B. P. *Macedonian Parsley*.
 Bubon, Sp. 1.
 Aquilegia sylvestris. C. B. P. *Wild Columbine*. English, *In Woods, but rare*. Sp. 1.
 Aristolochia clematis recta. C. B. P. *Creeping Birthwort*. Sp. 3.
 Aristolochia longa vera. C. B. P. *Long Birthwort*. Sp. 2.
 Aristolochia rotunda, flore ex purpura nigro. C. B. P. *Round Birthwort*. Sp. 1.
 Artemisia vulgaris major. C. B. P. *Mugwort*. English, *On the Sides of Fields*. Sp. 1.
 Arum vulgare. Ger. *Wake Robin*. English, *In Woods, and under Hedges*. Sp. 1.
 Arundo vulgaris, five Phragmites Dioscoridis. C. B. P. *The Reed*. English, *In deep Waters*. Sp. 1.
 Asarum vulgare. Park. *Asarabacca*. English, *In moist shady Places, but rare*. Sp. 1.
 Asclepias flore albo. C. B. P. *Swallow Wort, or Tame Poison*. Sp. 1.
 Asparagus fativus. C. B. P. *Sparagus*. Sp. 1.

Aspe-

CATALOGUE OF PLANTS.

- Asperula fve Rubeola montana odora*. C. B. P. *Wood-roof*. English, *In Woods and shady Places*. Sp. 1.
- Asphodelus albus ramosus mas*. C. B. P. *The true white Asphodel, or King's Spear*. Sp. 2.
- Asphodelus luteus, & flore, & radice*. C. B. P. *Yellow King's Spear*. Sp. 1.
- Asplenium, fve Ceterach*. J. B. *Spleenwort, or Milt-waste*. English, *On old Walls*.
- Aster Atticus coruleus vulgaris*. C. B. P. *Blue Italian Starwort*. Sp. 2.
- Atractylis lutea*. C. B. P. *Yellow Distaff Thistle*. *Carthamus*, Sp. 2.
- Atriplex hortensis alba, fve pallide virens*. C. B. P. *Garden Orach*. Sp. 1.
- Atriplex foetida*. C. B. P. *Stinking Orach*. English, *On Dungbills, and in cultivated Lands*. *Chenopodium*, Sp. 2.
- Balsamita major*. Dod. p. *Costmary, or Ale-cost*. *Tanacetum*, Sp. 3.
- Bardana vulgaris major*. Park. *Burdock*. English, *By the Sides of Roads*. *Arctium*. Sp. 1.
- Behen album officinarum*. J. B. *Spatling Poppy*. English, *On arable Land*. *Cucubalus*, Sp. 2.
- Bellis sylvestris, caule folioso, major*. C. B. P. *Ox-eye Daisy*. English, *In Corn Fields, and in Pastures*. *Chrysanthemum*, Sp. 2.
- Bellis sylvestris minor*. C. B. P. *Daisy*. English, *In Grass Fields*. Sp. 1.
- Berberis dumetorum*. C. B. P. *The Berberry, or Piperidge Bush*. English, *In some Hedges*. Sp. 1.
- Beta alba vel pallescens, quæ Cicla officinarum*. C. B. P. *The white Beet*. Sp. 2.
- Beta rubra vulgaris*. C. B. P. *The red Beet*. Sp. 3.
- Betonica purpurea*. C. B. P. *Wood Betony*. English, *In Woods, &c*. Sp. 1.
- Bistorta radice minus intorta*. C. B. P. *Bistort, or Snake-weed*. English, *In moist Meadows*. Sp. 1.
- Blitum album majus*. C. B. P. *White Blites*. *Amaranthus*, Sp. 8.
- Blitum rubrum majus*. C. B. P. *Red Blites*. *Amaranthus*. Sp. 6.
- Borago floribus cœruleis*. J. B. *Borage*. English, *In arable Land*. Sp. 1.
- Botrys ambrosioides vulgaris*. C. B. P. *Oak of Jerusalem*. *Chenopodium*. Sp. 4.
- Brassica capitata alba*. C. B. P. *Cabbage*. Sp. 1.
- Bryonia aspera, fve alba, baccis rubris*. C. B. P. *Briony*. English, *under Hedges, and on the Sides of Banks*. Sp. 1.
- Bryonia lævis, fve nigra, ramosa*. C. B. P. *Black Briony*. English, *In Woods, and under Hedges*. *Tamus*, Sp. 1.
- Buglossum angustifolium majus*. C. B. P. *Garden Bugloss*. *Anchusa*, Sp. 1.
- Buglossum sylvestre minus*. C. B. P. *Wild Bugloss*. English, *On arable Land*. *Lycopsis*, Sp. 1.
- Bugula vulgaris*. Park. *Bugle*. English, *In moist Meadows and Woods*. Sp. 1.
- Buphthalmum cotulæ folio*. C. B. P. *Ox-eye Anthemis*, Sp. 12.
- Bursa, pastoris major, folio sinuato*. C. B. P. *Shepherd's Purse*. English, *By the Sides of Paths every where*. Sp. 1.
- Buxus arborescens*. C. B. P. *The Box Tree*. English, *On Box Hill, near Darkin in Surry*. Sp. 1.
- Calamintha vulgaris, vel Officinarum Germaniæ*. C. B. P. *Mountain Calamint*. English, *On uncultivated Lands*. *Melissa*.
- Calamintha pulegii odore, fve Nepeta*. C. B. P. *Calamint with the Scent of Penny-royal*. English, *On the Sides of Roads, and other uncultivated Places*. *Melissa*.
- Calamintha arvensis verticillata*. C. P. P. *Water Calamint*. English. *By the Sides of Ditches, and in moist arable Land*. *Mentha*.
- Calcitrapa flore purpureo*. Vaill. *The Star Thistle*. English. *On the Sides of Banks*. *Centaurea*. Sp. 40.
- Lin.*
- Caltha vulgaris*. C. B. P. *Marigold*. *Calendula*. Sp. 2.
- Cannabis sativa*. C. B. P. *Hemp*. English, *On Dungbills*. Sp. 1.
- Capparis spinosa, fructu minore, folio rotundo*. C. B. P. *Caper*. Sp. 1.
- Cardamine magno flore purpurascens*. Inst. R. H. *Ladies Smock, or Cuckow Flower*. English, *In Meadows*. Sp. 1.
- Cardiaca*. Inst. R. H. *Motherwort*. English. *By the Sides of Paths*. Sp. 1.
- Carduus albis maculis notatus, vulgaris*. C. B. P. *Our Lady's Thistle*. English, *On uncultivated Places*. Sp. 4.
- Carlina acaulos, magno flore*. C. B. P. *The Carlina Thistle*. Sp. 3.
- Carthamus officinarum, flore croceo*. Inst. R. H. *Saffron Flower, or Bastard Saffron*. Sp. 1.
- Carui. Cæsalp. Caraway*. English, *On Dungbills, but rare*. *Carum*. Sp. 1.
- Caryophyllata vulgaris*. C. B. P. *Avens, or Herb Bennet*. English, *In Woods, and under Hedges*. *Geum*. Sp. 1.
- Caryophyllus altilis major*. C. B. P. *Clave Gilli-flower*. *Dianthus*, Sp. 5.
- Centaureum majus, folio in lacinias plures diviso*. C. B. P. *Great Centaury*. *Centaurea*, Sp. 3.
- Centaureum minus*. C. B. P. *Centaury*. English, *In cultivated Lands, and in Woods*. *Gentiana*, Sp. 1.
- Cepa vulgaris*. C. B. P. *Onion*.
- Chærophyllum fativum*. C. B. P. *Cbervil*. Sp. 5.
- Chamædry, vulgo vera existimata*. J. B. *Germander*. English, *in chalky Lands*. *Teucrium*, Sp. 6.
- Chamæmelum nobile, fve Leucanthemum odoratum*. C. B. P. *Chamomile*. English, *On Commons and Heath*. *Anthemis*, Sp. 2.
- Chamæmelum vulgare Leucanthemum Dioscoridis*. C. B. P. *May Weed, Field Chamomile*. English, *On arable Land, and Dungbills*. *Anthemis*, Sp. 2.
- Chamæpitis lutea vulgaris, fve folio trifido*. C. B. P. *Ground Pine*. English, *On arable Land*. *Teucrium*, Sp. 16.
- Chelidonium majus vulgare*. C. B. P. *Celandine*. English. *In Woods, and under Hedges*. Sp. 1.
- Chelidonia, rotundifolia minor*. C. B. P. *Pilewort*. Eng-

CATALOGUE OF PLANTS.

- English, By the Sides of Ditches, and in other moist Places. *Ranunculus*.
- Chenopodium folio triangulo*. Inst. R. H. *Mercury*, or *All-good*. English, In Lanes and unfrequented Places. Sp. 1.
- Cicer, sativum*. C. B. P. *Cicers*, or *Chick Peas*. Sp. 1.
- Cichorium sylvestre, sive officinarum*. C. B. P. *Wild Succory*. English, In Lanes and Commons, Sp. 1.
- Cicuta major*. C. B. P. *Hemlock*. English, On the Side of Banks. *Conium*. Sp. 1.
- Cinara hortenſis, foliis aculeatis, & non aculeatis*. C. B. P. *Artichoke*. Sp. 1.
- Cistus mas, folio oblongo incano*. C. B. P. *Holy Rose*. Sp. 2.
- Cistus ladinifera Cretica, flore purpureo*. Tourn. Cor. *The Gum Cistus*. Sp. 9.
- Cnicus sylvestris hirsutior, sive carduus Benedictus*. C. B. P. *Carduus*, or *the Blessed Thistle*. Sp. 1.
- Cochlearia folio subrotundo*. C. B. P. *Scurvy Grass*. Sp. 1.
- Cochlearia folio sinuato*. C. B. P. *Sea Scurvy Grass*. English, In Salt Marshes. Sp. 2.
- Conyza major vulgaris*. C. B. P. *On dry Land*. Sp. 1.
- Conyza minor, flore globoſo*. C. B. P. *Flea-bane*. English, On chalky uncultivated Ground. *Inula*. 6. Lin. Sp. 1.
- Coriandrum majus*. C. B. P. *Coriander*. Sp. 1.
- Coronopus sylvestris hirsutior*. C. B. P. *Buckhorn Plantain*. English, On Commons and uncultivated Places. *Plantago*. Lin.
- Coronopus Ruellii*. J. B. *Swines Cress*. English, On moist Commons. *Cochlearia*. Lin. Sp. 5.
- Corylus sylvestris*. C. B. P. *Hazel*. English, In Woods. Sp. 1.
- Cotula foetida*. Dod. *Stinking Chamomile*. English, On arable Land. *Anthemis*.
- Cotyledon major*. C. B. P. *Navelwort*, or *Wall Pennywort*. English, On the Sides of Banks, but rare. Sp. 1.
- Crithmum, sive fœniculum maritimum minus*. C. B. P. *Campfire*. English, On the Rocks by the Sea Side. Sp. 1.
- Crocus sativus*. C. B. P. *Saffron*. Sp. 1.
- Cruciata hirsuta*. C. B. P. *Crosswort*. English, By the Sides of Hedges. *Valantia*. Lin.
- Cucumis sylvestris asininus dictus*. C. B. P. *Wild Cucumber*. *Momordica*. Sp. 4.
- Cucumis sativus vulgaris*. C. B. P. *Garden Cucumber*. Sp. 1.
- Cupressus meta in fastigium convoluta, quæ fœmina Plinii*. C. B. P. *The Common Cypress*. Sp. 1.
- Cyanus montanus latifolius, vel verbasculum cyanoides*. C. B. P. *The Great Blue Bottle*. *Centaurea*. Sp. 7.
- Cyanus minor, sive segetum*. C. B. P. *The Small Blue Bottle*. English, Amongst Corn, &c. *Centaurea*. Sp. 11.
- Cyclamen hederæ folio*. C. B. P. *Squibread*. Sp. 1.
- Cynoglossum majus vulgare*. C. B. P. *Hounds-tongue*. English, By Hedge Sides, and in other uncultivated Places. Sp. 1.
- Cyperus odoratus, radice longa, sive Cyperus officinarum*. C. B. P. *Long Cyperus*.
- Daucus foliis fœniculi tenuissimis*. C. B. P. *Daucus of Crete*, or *Candy Carrot*. *Athamanta*. Sp. 2.
- Daucus vulgaris*. Clus. Hist. *Wild Carrot*, or *Birds-nest*. English, On the Puts of Rocks, and other uncultivated Places. Sp. 1.
- Delphinium majus, sive vulgare*. Park. *Larkspur*. Sp. 1.
- Dens leonis latiore folio*. C. B. P. *Dandelion*. English, On Walls, and in Grass Fields every where. *Leontodon*. Sp. 1.
- Digitalis purpurea, folio aspero*. C. B. P. *Fox-glove*. English, On the Sides of Banks, and in other uncultivated Places. Sp. 1.
- Dipsacus sativus*. C. B. P. *The manured Teasel*. Sp. 2.
- Dipsacus sylvestris, aut Virga pastoris major*. C. B. P. *The wild Teasel*. English, On dry Banks. Sp. 1.
- Doronicum radice scorpii*. C. B. R. *Leopardbane*. Sp. 1.
- Dracunculus polyphyllus*. C. B. P. *Dragons*. *Arum*. Sp. 8.
- Echium vulgare*. C. B. P. *Vipers-bugloss*. English, On fallowed Land, and amongst the Corn. Sp. 1.
- Elatine folio subrotundo*. C. B. P. *Fluellin*, or *female Speedwell*. English, On arable Land. *Linaria*.
- Endivia latifolia sativa*. C. B. P. *Endive*. *Cichorium*. Sp. 4.
- Equisetum palustre, longioribus setis*. C. B. P. *Horse-tail*. English, By the Side of Ditches, and other moist Places.
- Eruca latifolia alba, sativa Dioscoridis*. C. B. P. *Rocket*. Sp. 1.
- Eryngium maritimum*. C. B. P. *Eryngo*. English, On the Sides of Sea Shores. Sp. 1.
- Erysimum vulgare*. C. B. P. *Hedge Mustard*. English, On Walls, and by the Way-sides, very common. Sp. 1.
- Eupatorium cannabinum*. C. B. P. *Hemp-leaved Agrimony*. English, By the Sides of Ditches, and standing Waters. Sp. 1.
- Euphrasia officinarum*. C. B. P. *Eye-bright*. English, In Commons, and uncultivated Fields. Sp. 1.
- Faba*. C. B. P. *The Garden Bean*. Sp. 1.
- Faba minor, sive Equina*. C. B. P. *The Horse Bean*. Sp. 2.
- Filipendula vulgaris, an Molon Plinii*. C. B. P. *Dropwort*. English, On Commons, &c. *Spiræa*. Sp. 10.
- Filix ramosa major, pinnulis obtusis non dentatis*. C. B. P. *Female Fern*. English, On Commons and Heath. Sp. 1.
- Filix non ramosa dentata*. C. B. P. *The male Fern*. English, On the Sides of Banks, and in Woods. Sp. 2.
- Fœniculum vulgare Germanicum*. C. B. P. *Fennel*. English, On uncultivated Ground. Sp. 1.
- Fœniculum dulce*. C. B. P. *Sweet Fennel*. Sp. 3.
- Fœnum Græcum sativum*. C. B. P. *Fenugreek*. *Trigonella*. Sp. 1.
- Fragaria vulgaris*. C. B. P. *Strawberry*. English, In Woods. Sp. 1.
- Frangula, seu Alnus nigra, baccifera*. Park. *Berry-bearing Alder*. English, In moist Woods. Sp. 1.
- Fraxinella*. Clus. Hist. *Fraxinella*, or *white Dittany*. *Dictamnus*. Sp. 1.

A CATALOGUE OF PLANTS.

- Fumaria officinarum*, & *Dioscoridis*. C. B. P. *Fumitory*. English, *On arable Land*. Sp. 1.
Galega vulgaris. C. B. P. *Goats-rue*. Sp. 1.
Gallium luteum. C. B. P. *Ladies Bedstraw*, or *Cheese-vening*. English, *On the Side of Banks, in Meadows*. Sp. 1.
Genista angulosa, & *scoparia*. C. B. P. *Broom*. English, *On Commons, &c.* *Spartium*. Sp. 5.
Gentiana major lutea. C. B. P. *Gentian*, or *Felwort*. Sp. 1.
Geranium, folio *malvæ rotundo*. C. B. P. *Doves-foot*, *Cranes-bill*. English, *On the Sides of Banks*.
Geranium moschatum. C. B. P. *Musk Cranes-bill*. English, *In unrequented Lanes, but rare*. Sp. 17.
Geranium Robertianum primum, C. B. P. *Herb Robert*. English, *By Hedges*.
Glycyrrhiza siliquosa, vel *Germanica*. C. B. P. *Liquorice*. Sp. 1.
Gnaphalium vulgare majus. C. B. P. *Cutweed*. English, *On Commons, &c.* *Filago*. Lin.
Gramen caninum arvense, five *Gramen Dioscoridis*. C. B. P. *Dog Grass*, or *Couch Grass*. English, *On arable Land every where*.
Gratiola centauroides. C. B. P. *Hedge Hyssop*. Sp. 1.
Grossularia spinosa fativa. C. B. P. *Gooseberry*. Sp. 1.
Harmala. Dod. p. *Wild Rue*. *Peganum*
Hedera arborea. C. B. P. *Ivy*. English, *Climbing on Trees*. Sp. 1.
Hedera terrestris vulgaris. C. B. P. *Ground Ivy*, or *Ale-hoof*. English, *Under Hedges, and on Bank sides*.
Glechoma. Lin.
Helenium vulgare. C. B. P. *Elecampane*. *Inula*. Sp. 1.
Helleborus albus, flore *subviridi*. C. B. P. *White Hellebore*. *Veratrum*. Sp. 1.
Helleborus niger, flore *Roseo*. C. B. P. *Black Hellebore*. Sp. 3.
Hepatica flore simplici cæruleo. Clus. Hist. *Noble Liverwort*. Sp. 1.
Herba Paris, Ger. *Herb Paris*, *One-berry*, or *True-love*. English, *In shady Woods*. Paris, Sp. 1.
Herniaria glabra. J. B. *Rupturewort*. Sp. 1.
Hieracium majus, folio *fonchi*. C. B. P. *Hawkweed*. English, *On the Way-sides pretty common*.
Hordeum disticum. C. B. P. *Barley*. Sp. 1.
Horminum Sclarea dictum. C. B. P. *Clary*. *Sclarea*. Sp. 1.
Horminum sylvestre, *lavendulæ flore*. C. B. P. *Wild Clary*. English, *On uncultivated Fields*. Sp. 1.
Hyacinthus oblongo flore, *cæruleus major*. C. B. P. *Hair-bells*. English, *in Woods, and other Hedges*. Sp. 1.
Hyoscyamus albus major. C. B. P. *White Henbane*. Sp. 1.
Hyoscyamus vulgaris niger. C. B. P. *Black Henbane*. English, *On Commons and uncultivated Land*. Sp. 1.
Hypericum vulgare. C. B. P. *St. John's Wort*. English, *Under Hedges, and by the Way-sides*. Sp. 1.
Hyssopus officinarum, *cærulea seu spicata*. C. B. P. *Hyssop*. Sp. 1.
Jasminum vulgatum, flore *albo*. C. B. P. *Jasmine*. Sp. 1.
Iberis latiore folio. C. B. P. *Scitica Cress*. *Lepidium*. Sp. 4.
Imperatoria major. C. B. P. *Masterwort*. Sp. 1.
Iris alba Florentina. C. B. P. *Orris*
Iris vulgaris Germanica, five *sylvestris*. C. B. P. *Garden Fleur-de-lis*. Sp. 2.
Iris sylvestris fœtida. Inst. R. H. *Stinking Gladwin*. English, *In Woods, and most uncultivated Places*. Sp. 19.
Iris palustris lutea. Ger. *Bastard Acorus*. English, *In standing Waters*. Sp. 1.
Isatis fativa vel latifolia. C. B. P. *Wood*. Sp. 1.
Juniperus vulgaris fruticosa. C. B. P. *Juniper*. English, *On Heaths*. Sp. 1.
Kali majus, *cochleato semine*. C. B. P. *Glass wort*. *Salsola*. Sp. 3.
Lactuca fativa. C. B. P. *Lettuce*. Sp. 1.
Lamium album non færens, folio *oblongo*. C. B. P. *White Archangel*. English, *Under Hedges*. Sp. 2.
Lamium purpureum fœtidum, folio *subrotundo*, five *Galeopsis Dioscoridis*. C. B. P., *Red Archangel*, or *Dead Nettle*. English, *On the Sides of Banks*. Sp. 1.
Lapathum folio acuto plano. C. B. P. *Sharp-pointed Dock*. English, *In Fields, and uncultivated Places*. Sp. 4.
Lapathum aquaticum, folio *cubitali*. C. B. P. *The great Water Dock*. English, *In standing Waters*. Sp. 3.
Lapathum hortenise rotundifolium, five *montanum*. C. B. P. *Bastard Monks Rhubarb*. Sp. 2.
Lapathum folio acuto, *rubente*. C. B. P. *Bloodwort*. English, *On the Way side*.
Lapathum hortenise, folio *oblongo five secundum* *Dioscoridis*. C. B. P. *Patience*. Sp. 1.
Lapathum hortenise latifolium. C. B. P. *True Monks Rhubarb*.
Lapathum præstantissimum, *Rhabarbarum officinarum dictum*. Moris. *Rhapontick*. *Rheum*. Sp. 2.
Lavendula angustifolia. C. B. P. *Lavender*. Sp. 2.
Lavendula latifolia. C. B. P. *Lavender Spike*. Sp. 1.
Laureola sempervirens, flore *viridi*, quibusdam *Laureola mas*. J. B. *Spurge Laurel*. English, *In Woods*.
Daphne. Sp. 2.
Laureola folio deciduo, flore *purpureo*, officinis *Laureola fœmina*. C. B. P. *Mezereon*, or *Spurge Olive*.
Daphne. Sp. 1.
Laurus vulgaris. C. B. P. *The Bay*. Sp. 2.
Lens vulgaris. C. B. P. *The Lentil*. Sp. 1.
Lenticula palustris vulgaris. C. B. P. *Ducks-meat*. English, *On the Surface of standing Waters every where*.
Lepidium latifolium. C. B. P. *Dittander*, or *Pepperwort*. English, *On uncultivated Ground, but not very common*. Sp. 1.
Leucoium incanum majus. C. B. P. *Stock gilliflower*.
Cheiranthus. Sp. 6.
Leucoium luteum vulgare. C. B. P. *Wall Flower*. English, *On old Walls and Buildings*. *Cheiranthus*. Sp. 3.
Levisticum vulgare. C. B. P. *Levage*. *Ligusticum*. Sp. 1.
Lichen terrestris cinereus. Raii. Syn. *Asb-coloured Ground Liverwort*. English, *On Heaths and Commons*.
Ligustrum Germanicum. C. B. P. *Privet*. English, *In Hedges*. Sp. 1.

Lilium

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Lilium album, flore erecto, & vulgari. C. B. P. *The White Lily*. Sp. 1.

Lilium convallium album. C. B. P. *Lilies of the Valley*. English, *In shady Woods*. *Convallaria*, Sp. 1.

Limonium maritimum majus. C. B. P. *Sea Lavender*. English, *In the Salt Marshes*. Sp. 1.

Linaria vulgaris lutea, flore majore. C. B. P. *Toad-flax*. English, *On the Side of Banks*. Sp. 1.

Lingua cervina officinarum. C. B. P. *Harts-tongue*. English, *On the Walls of Wells, and other moist Places*.

Linum sativum. C. B. P. *Flax*. Sp. 1.

Linum pratense, flosculis exiguus. C. B. P. *Mountain or purging Flax*. English, *In Meadows and Pastures*. Sp. 13.

Lithospermum majus erectum. C. B. P. *Gromill or Greymill*. English, *On uncultivated Land*. Sp. 1.

Lotus hortensis odora. C. B. P. *Sweet Trefoil*. *Trifolium*. Sp. 12.

Lunaria racemosa minor. C. B. P. *Monkwort*. English, *On Commons and Heaths*.

Lupinus sativus, flore albo. C. B. P. *White Lupin*. Sp. 5.

Lupulus mas & foemina. C. B. P. *Hop*.

Lycopersicon fructu cerasi. Inst. R. H. *Love Apple*. Sp. 1.

Lyfimachia lutea major. C. B. P. *Loofstrife*. English, *On the Side of Ditches*. Sp. 1.

Marjorana vulgaris. C. B. P. *Sweet Marjoram*. *Origanum*, Sp. 7.

Malva sylvestris, folio sinuato. C. B. P. *Mallow*. English, *On Banks and uncultivated Places*. Sp. 1.

Malva rosea, folio subrotundo. C. B. P. *Hollyhock*. *Alcea*, Sp. 1.

Mandragora fructu rotundo. C. B. P. *Mandrake*. Sp. 1.

Marrubium album vulgare. C. B. P. *White Horsebound*. English, *On dry chalky Land*. Sp. 1.

Marrubium nigrum sœtidum, Ballote Dioscoridis. C. B. P. *Black, or stinking Horsebound*. English, *On Banks, and by the Way side*. *Ballote*, Sp. 1.

Marum vulgare. Ger. *Herb Mastich, or Mastich Thyme*. *Satureja*, Sp. 4.

Marum Syriacum vel Creticum. H. L. *Marum, or Syrian Mastich*. *Teucrium*, Sp. 7.

Matricaria vulgaris, vel fativa. C. B. P. *Feverfew*. English, *On Dunghills and in unfrequented Places*. Sp. 1.

Melilotus officinarum Germaniæ. C. B. P. *Melilot*. English, *By the Side of cultivated Fields*. *Trifolium*, Sp. 11.

Melissa hortensis. C. B. P. *Balm*. Sp. 1.

Mentha angustifolia spicata. C. B. P. *Mint, or Spear Mint*. Sp. 1.

Mentha rotundifolia palustris, seu aquatica major. C. B. P. *Water Mint*. English, *In Ditches, and shallow Waters*. Sp. 11.

Mentha spicis brevioribus & habitioribus, foliis menthæ fuscæ, sapore fervido piperis. Raii Syn. *Pepper Mint*. English, *In watery Places*. Sp. 6.

Mentha sylvestris, longiore folio. C. B. P. *Horfe Mint*. English, *In uncultivated Places*. Sp. 4.

Mercurialis testiculata sive mas, & spicata, sive foemina

Dioscoridis & Plinii. C. P. P. *French Mercury*. English, *On the Way-side*. Sp. 2.

Mespilus apii folio, sylvestris, spinosa, sive oxyacantha. C. B. P. *The White Thorn, or Hawthorn*. English, *In Hedges*. Sp. 4.

Mespilus vulgaris. J. B. *The common Medlar*. Sp. 1.

Meum foliis anethi. C. B. P. *Mew, or Spignak*.

Athamanta. Sp. 1.

Milium semine luteo vel albo. C. B. P. *Millet*. Sp. 1.

Millefolium vulgare album. C. B. P. *Yarrow, Milfoil, or Nofell ed*. English, *By the Path-sides every where*. *Achillæa*, Sp. 1.

Myrrhis magno semine longo sulcato. J. B. *Sweet Cicely, or sweet Fern*. *Scandix*, Sp. 5.

Napus sativus. C. B. P. *Sweet Navew, or French Turnep*. *Rapa*, Sp. 2.

Napus sylvestris. C. B. P. *Wild Navew, or Cole-feed*. English, *On Banks*. *Rapa*, Sp. 3.

Nasturtium aquaticum supinum. C. B. P. *Water Cress*. English, *In Ditches, and standing Waters*. *Sisymbrium*, Sp. 1.

Nasturtium hortense vulgatum. C. B. P. *Garden Cress*. Sp. 1.

Nepeta maior vulgaris. Park. *Nep, or Cat Mint*. English, *On chalky dry Fields*. Sp. 1.

Nicotiana major latifolia. C. B. P. *Tobacco*. Sp. 2.

Nigella flore minore simplici candido. C. B. P. *Field Flower*. Sp. 3.

Ocimum vulgatum. C. B. P. *Basil*. Sp. 1.

Olea sativa. C. B. P. *The Olive Tree*. Sp. 1.

Ophioglossum vulgatum. C. B. P. *Adders-tongue*. English, *In moist Meadows*.

Orchis morio mas, foliis maculatis. C. B. P. *Male Satyrium, or Fools-stones*. English, *In Woods and moist Meadows*. Sp. 2.

Orchis morio foemina. C. B. P. *Female Satyrium*. English, *In Meadows*. Sp. 1.

Origanum sylvestre, cunila bubula Plinii. C. B. P. *Wild Marjoram*. English, *On dry uncultivated Places*. Sp. 1.

Origanum onites. C. B. P. *Origany of Crete*. Sp. 6.

Orobis siliquis articulatis, semine majore. C. B. P. *Bitter Vetch*. *Ervum*, Sp. 5.

Osmunda regalis. Ger. *Flowering Fern, or Osmund-royal*. Sp. 1.

Oxys. Inst. R. H. *Wood Sorrel*. English, *In moist Woods*. *Oxalis*. Sp. 1.

Pæonia foemina, flore rubro majore. C. B. P. *Piony*. Sp. 2.

Pæonia folio nigricante splendido, quæ mas. C. B. P. *Male Piony*. Sp. 1.

Panax coloni, & marrubium aquaticum acutum. Ger. *Clowns All-beak*. English, *By the Side of Ditches, and other watry Places*. *Stachys*, Sp. 8.

Panax pastinacæ folio. C. B. P. *Hercules's All-beak*. *Pastinaca*, Sp. 3.

Paniculum Germanicum, sive panicula minore. C. B. P. *Panic*. Sp. 1.

Papaver hortense, semine albo. C. B. P. *White Poppy*. Sp. 9.

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- Papaver hortense*, semine nigro. C. B. P. *Black Poppy*. Sp. 8.
Papaver erraticum, Rhoias Dioscoridi, Theophrasto, Plinio. C. B. P. *Red Poppy*. English, On arable Land. Sp. 1.
Parietaria officinarum. C. B. P. *Pellitory of the Wall*. English, On Walls. Sp. 1.
Paronychia rutaceo folio. Ger. *Blue-leaved Whitlow Grass*. English, On Walls and Buildings. *Saxifraga*, Lin.
Pastinaca sativa latifolia. C. B. P. *Parsnep*. Sp. 2.
Pastinaca sylvestris latifolia. C. B. P. *Wild Parsnep*. English, On uncultivated Places. Sp. 1.
Pentaphylloides argentina dicta. Raii Syn. *Silver Weed*, or wild *Tansy*. English, on moist Commons, and by the Sides of Ditches. *Potentilla*, Sp. 1.
Perfoliata vulgarissima, five *arvensis*. C. B. P. *Thorough Wax*. English, On arable Land. *Bupleurum*, Sp. 1.
Periclymenum non perfoliatum Germanicum. C. B. P. *Honey-suckle*. English, In Hedges. Sp. 5.
Perficaria mitis maculosa. C. B. P. *Spotted Arsefmart*, English, On Dungbills. Sp. 2.
Perficaria urens, seu *hydropiper*. C. B. P. *Arsefmart*, or *Water Pepper*. English, By the Side of Ditches, and in other watery Places. Sp. 1.
Petasites major & vulgaris. C. B. P. *Butter-bur*. English, By Ditch-sides. Sp. 1.
Peucedanum Germanicum. C. B. P. *Hogs Fennel*, or *Sulphur-wort*. English, But very rare. Sp. 1.
Phellandrium, vel *cicutaria aquatica* quorundam. J. B. *Water Hemlock*. English, In standing Waters.
Pilosella major ripens hirsuta. C. B. P. *Mouse-ear*. English, On Walls and dry gravelly Commons.
Pimpinella sanguisorba minor. C. B. P. *Burnet*. English, On chalky Ground. *Potentilla*, Sp. 1.
Pimpinella saxifraga major, umbella candida, C. B. P. *Burnet Saxifrage*. English, Under Hedges, and by the Side of Fields. Sp. 2.
Pimpinella saxifraga major altera. C. B. P. *The lesser Burnet Saxifrage*. English, In Pastures. Sp. 1.
Pisum arvense, flore, candido, fructu rotundo albo. C. B. P. *Peas*. Sp. 1.
Plantago latifolia sinuata. C. B. P. *Plantain*. English, In moist Places.
Plantago angustifolia major. C. B. P. *Narrow leaved Plantain*, or *Ribwort*. English, On Dungbills, and by the Way-side every where.
Plumbago quorundam. Clus. H. *Toothwort*, or *Leadwort*. Sp. 1.
Polium maritimum erectum Monspeliacum. C. B. P. *Poley Mountain*. Sp. 4.
Polium angustifolium Creticum. C. B. P. *Poley of Crete*. Sp. 5.
Polygonatum latifolium vulgare. C. B. P. *Solomon's Seal*. English, In some Woods, but not common. *Convallaria*, Sp. 3.
Polygonum latifolium. C. B. P. *Knot-grass*. English, In uncultivated Places.
Polypodium vulgare. C. B. P. *Polypody*. English, On shady Banks and Walls. Sp. 1.
Porrum commune capitatum. C. B. P. *The Leek*. Sp. 1.
Portulaca latifolia, seu *sativa*. C. B. P. *Purflane*. Sp. 1.
Primula veris. Inst. R. H. *Primrose*. English, In Woods and under Hedges. *Primula*, Sp. 1.
Primula veris major. Ger. *Cowslip*, or *Pagels*. English, In Meadows. *Primula*, Sp. 2.
Prunella major, folio non dissecto. *Self-beal*. English, In Meadows and Pasture Land. Sp. 1.
Prunus sylvestris. C. B. P. *The Sloe Tree*. English, In Hedges. Sp. 1.
Psyllium majus erectum. C. B. P. *Fleawort*. Sp. 1.
Ptarmica vulgaris, folio longo serrato, flore albo. J. B. *Sneezwort*. English, In Woods, and under Hedges, *Achillea*, Sp. 10.
Pulegium angustifolium. C. B. P. *Peny-royal*. English, On moist Commons. Sp. 1.
Pulegium angustifolium. C. B. P. *Hart's Peny-royal*, Sp. 3.
Pulmonaria maculosa latifolia. Park. *Spotted Lungwort*, or *Jerusalem Sage*. Sp. 1.
Punica sativa. Inst. R. H. *Pomegranate*. Sp. 1.
Punica sylvestris, flore pleno majore. Inst. R. H. *The Wild Pomegranate with a large double Flower*. Sp. 2.
Pyrethrum Hispanicum. C. B. P. *Pellitory of Spain* *Anthemis*, Sp. 11.
Pyrola rotundifolia major. C. B. P. *Winter-green*, In shady Woods in the North of England. Sp. 1.
Quinquefolium majus repens. C. B. P. *Cinquefoil*. English, In Pastures. *Potentilla*, Lin.
Ranunculus pratensis, radice verticilli modo rotundo. C. B. P. *Crow-foot*. English, In Pastures.
Ranunculus apii folio, laevis. C. B. P. *Marsh Crow-foot*. English, very common in standing Waters.
Rapa rotunda sativa. C. B. P. *Turnep*. Sp. 1.
Raphanus minor oblongus. C. B. P. *Radish*. Sp. 1.
Raphanus rusticus. C. B. P. *Horse-radish*. English, On Dungbills, and by the Side of Fields. *Cochlearia*, Sp. 5.
Rhamnus catharticus. C. B. P. *Buckthorn*. English, In Hedges. Sp. 1.
Rhus folio ulmi. C. B. P. *Sumach*. Sp. 1.
Ribes vulgare, fructu rubro. H. L. *Red Currants*. Sp. 1.
Ros folis folio rotundo. C. B. P. *Rosa-folis*, or *Sundew*. English, On Commons where there are Bogs.
Rosa alba vulgaris major. C. B. P. *The White Rose*. Sp. 16.
Rosa Damascena, flore pleno. Hort. Eyst. *The Damask Rose*. Sp. 15.
Rosa rubra multiplex. C. B. P. *The Red Rose*. Sp. 20.
Rosa sylvestris vulgaris, flore odorato incarnato. C. B. P. *The Dog Rose*, or *Wild Briar*. English, In Hedges. Sp. 1.
Rosmarinus hortenensis, angustiori folio. C. B. P. *Rosemary*. Sp. 1.
Rubia tinctorum sativa. C. B. P. *Madder*. Sp. 1.
Rubus vulgaris, five *rubus fructu nigro*. C. B. P. *The Bramble*, or *Blackberry*. English, Very common in Hedges. Sp. 1.
Rubus Idæus spinosus, fructu rubro. J. B. *Raspberry Bush*. English, In some Woods. Sp. 3.
Ruscus

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- Ruscus myrtifolius aculeatus*. Inst. R. H. *Knee-holm*, or *Butchers-broom*. English, *In Woods*, and *on Commons*, Sp. 1.
- Ruscus latifolius*, fructu folio innascente. Inst. R. H. *Horse-tongue*, or *Double-tongue*. Sp. 2.
- Ruscus latifolius*, fructu folio insidente. Inst. R. H. *The Bay of Alexandria*. Sp. 3.
- Ruta hortensis latifolia*. C. B. P. *Rue*. Sp. 1.
- Ruta muraria*. C. B. P. *White Maiden-hair*, or *Wall Rue*. English, *On Walls*, and *other Buildings*, in moist Places.
- Sabina folio tamarisci Dioscoridis*. C. B. P. *Savin*. Sp. 1.
- Salvia nigra*. C. B. P. *Common Red Sage*. Sp. 1.
- Salvia minor*, aurita & non aurita. C. B. P. *Sage of Virtue*. Sp. 3.
- Sambucus fructu in umbella nigro*. C. B. P. *Elder*. English, *In Hedges*. Sp. 1.
- Sambucus racemosa rubra*. C. B. P. *Mountain Elder*. Sp. 3.
- Sambucus humilis*, five *ebulus*. C. B. P. *Dwarf Elder*, or *Danewort*. English, *But not common*. Sp. 4.
- Sanicula officinarum*. C. B. P. *Sanicle*. English, *In Woods and shady Places*.
- Santolina foliis teretibus*. R. H. *Lavender cotton*. Sp. 1.
- Saponaria major lævis*. C. B. P. *Sopewort*. English, *On the Side of Banks*. Sp. 1.
- Satureja hortensis*, five *Cunila fativa Plinii*. C. B. P. *Savory*. Sp. 1.
- Satureja montana durior*. C. B. P. *Winter-savory*. Sp. 3.
- Saxifraga rotundifolia alba*. C. B. P. *White Saxifrage*. English, *In Meadows*. Sp. 1.
- Scabiosa pratensis hirsuta*, quæ officinarum. C. B. P. *Scabious*. English, *On arable Land*. Sp. 1.
- Scabiosa radice succisa*, flore globoso. Rati Syn. *Devil-bit*, or *Wood-scabious*. English, *In Woods*, and *under Hedges*. Sp. 2.
- Scordium legitimum*. Park. *Scordium*, or *Water Germander*. English, *In watry Places*, but not common. *Teucrium*, Sp. 13.
- Scordium alterum*, five *salvia agrestis*. C. B. P. *Wood Sage*. English, *In Woods*, and *on Heaths*. *Teucrium*, Sp. 12.
- Scorzonera latifolia sinuata*. C. B. P. *Scorzonera*, or *Viper Grass*. Sp. 1.
- Scrophularia nodosa fœmina*. C. B. P. *Figwort*. English, *In Woods and shady Places*. Sp. 1.
- Scrophularia aquatica major*. C. B. P. *Water Figwort*, or *water Betony*. English, *By the Side of Ditches*. Sp. 2.
- Secale hybernum vel majus*. C. B. P. *Rye*. Sp. 1.
- Sedum majus vulgare*. C. B. P. *Houfleck*. English, *On House tops and Walls*. *Sempervivum*, Sp. 12.
- Sedum minus teretifolium album*. C. B. P. *Lesser Houfleck*. English, *On Walls*, &c. Sp. 1.
- Sedum minus vermiculatum acre*. C. B. P. *Wall Papper*, or *Stone-crop*. English, *On Walls and Buildings*. Sp. 5.
- Senecio minor vulgaris*. C. B. P. *Groundsel*. English, *On Walls*, and *on arable Lands*, and also *on By-paths every where*.
- Serpyllum vulgare minus*. C. B. P. *Mother-of-thyme*. English, *On Heaths and Commons*. *Thymus*, Sp. 6.
- Seseli pratense*. Silaus forte Plinio. C. B. P. *Meadow Saxifrage*. English, *In moist Pastures*.
- Siler montanum majus*. Mor. Umb. *Silver Mountain*, *Bastard Lovage*, or *common Hartwort*. Sp. 1.
- Sinapi rapi folio*. C. B. P. *Mustard*. English, *On Dung-bills*, &c. *Sinapis*, Sp. 2.
- Sinapi hortense*, semine albo. C. B. P. *White Mustard*. *Sinapis*, Sp. 1.
- Sisium Germanorum*. C. B. P. *Skirret*. *Sium*, Sp. 4.
- Sium latifolium*. C. B. P. *Broad-leaved Water Parsnep*. English, *In standing Waters*. Sp. 1.
- Sium aromaticum*, *Sison officinarum*. Inst. R. H. *The German*, or *common Amomum*. English, *Under Hedges*, and *in shady Lanes*. *Sison*. Sp. 1.
- Smyrnum*. Math. *Alexanders*. English, *By the Side of Fields*, but not common. Sp. 1.
- Solanum hortense*. Ger. *Nightshade*. English, *On Dung-bills*. Sp. 1.
- Solanum scandens*, seu *dulcamara*. C. B. P. *Woody Nightshade*. English, *In Hedges*. Sp. 8.
- Soldanella maritima minor*. C. B. P. *Seacal-wort*, or *Sea Bindweed*. English, *On the Sea Shore*. *Convolvulus*, Sp.
- Sonchus asper laciniatus*. C. B. P. *Prickly Sowthistle*. English, *On arable Land*.
- Sonchus lævis laciniatus latifolius*. C. B. P. *Smooth Sowthistle*. English, *With the former*.
- Sophia chirurgorum*. Ger. *Flixweed*. English, *On arable Land*. *Sisymbrium*, Sp. 6.
- Sorbus-fativa*. C. B. P. *The true Service*. Sp. 2.
- Sorbus torminalis*. Ger. *The wild Service*. English, *In Hedges*. *Cratægus*, Sp. 1.
- Spinachia vulgaris*, capsula feminis aculeata. Inst. *Spinach*. Sp. 1.
- Staphysagria*. Matth. *Staves-acre*. *Delphinium*, Sp. 11.
- Stæchas purpurea*. C. B. P. *Stæchas*, *French Lavender*, or *Stick-a-dere*. Sp. 1.
- Stæchas citrina tenuifolia Narbonensis*. J. B. *Goldylacks*. *Gnaphalium*, Sp. 1.
- Stramonium fructu spinoso oblongo*, flore albo. Inst. R. H. *Thorn-apple*. English, *On Dungbills*. *Datura*, Sp. 1.
- Symphytum consolida major fœmina*, flore albo, vel pallide luteo. C. B. P. *Comfrey*. English, *In uncultivated Places*. Sp. 1.
- Tamariscus Narbonensis*. Lob. *Tamarisk*. Sp. 1.
- Tanacetum vulgare luteum*. C. B. P. *Tansy*. English, *In unfrequented Lanes*. Sp. 1.
- Telephium vulgare*. C. B. P. *Orpine*. English, *In Woods*, and *moist Land*. *Sedum*, Sp. 14.
- Thapsia carotæ folio*. C. B. P. *Deadly Carrat*. Sp. 3.
- Thlaspi arvense*, filiquis latis. C. B. P. *Treacle Mustard*. English, *In arable Land*, but rare. Sp. 2.
- Thlaspi arvense*, vaccariæ incano folio, majus. C. B. P. *Mitbrilate Mustard*. English, *In arable Land*, and *near Hedges*. Sp. 1.
- Thuya Theophrasti*. C. B. P. *Tree of Life*. Sp. 1.
- Thymelæa foliis lini*. C. B. P. *Spurge-flax*. *Daphne*. Sp. 7.
- Thymus vulgaris*, folio tenuiore. C. B. P. *Thyme*. Sp. 2.

CATALOGUE OF PLANTS.

Tithymalus latifolius, Cataputia dictus. H. L. *Garden Spurge*. Euphorbia, Sp. 18.

Tithymalus palustris fruticosus. C. B. P. *German Spurge*, or greater *Esula*. Euphorbia, Sp. 22.

Tithymalus foliis pini, forte Dioscoridis Pityusa.

C. B. P. *The lesser Esula*. Euphorbia, Sp. 27.

Tormentilla sylvestris. C. B. P. *Tormentil*. English, On *Heaths*, Sp. 1.

Tragacantha. C. B. P. *Goats-thorn*. Sp. 1.

Trichomanes, sive *Politrichum officinarum*. C. B. P. *Maiden-hair*. English, On *Walls*, and the *Side of shady Banks*. Sp. 1.

Trifolium pratense purpureum majus. C. B. P. *Trefoil*. English, In *Pastures*. Sp. 1.

Tripholium arvense humile spicatum, sive *Lagopus*. C. B. P. *Hares-foot Trefoil*. English, On *arable Land*. Sp. 9.

Trifolium palustre. C. B. P. *Bog-bean*, or *Marsh Trefoil*. English, On *Bogs*. *Menyanthes*.

Triticum hybernium, aristis carens. C. B. P. *Wheat*. Sp. 1.

Tussilago vulgaris. C. B. P. *Colts-foot*. English, On *barren Land*. Sp. 1.

Valeriana hortensis, Phu folio olusatris Dioscoridis. C. B. P. *Valerian*. Sp. 1.

Valeriana palustris minor. C. B. P. *The lesser Valerian*. English, On *moist Meadows*, and in *Woods*.

Valeriana sylvestris major, foliis angustioribus. Rand. *Wild Valerian*. English, On *chalky Closes*. Sp. 2.

Verbascum mas latifolium luteum. C. B. P. *Mullein*. English, On *dry Banks*, and *sandy Land*. Sp. 1.

Verbena communis, cœruleo flore. C. B. P. *Vervain*. English, near *Farm Yards*. Sp. 1.

Veronica mas lupina, & vulgatissima. C. B. P. *Speedwell*, or *Paul's Betony*. English, In *woody Places*. Sp. 1.

Veronica aquatica major, folio subrotundo. Mor. Hist. *Brooklime*. English, In *standing Water*, Sp. 16.

Vicia sativa vulgaris, semine nigro. C. B. P. *Vetch*, or *Tare*. Sp. 5.

Vinca pervinca vulgaris. Ger. *Periwinkle*. English, In *Hedges and Woods*. *Vinca*, Sp. 1.

Viola martia purpurea, flore simplici odoro. C. B. P. *Violet*. English, In *Woods*, and near *Hedges*. Sp. 1.

Viola tricolor hortensis repens. C. B. P. *Heartsease*, or *Pansies*, common in the *North of England*. Sp. 10.

Virga aurea angustifolia minus ferrata. C. B. P. *Golden Rod*. English, In *Woods*, and near *Hedges*. *Solidago*, Sp. 1.

Vitex foliis angustioribus, cannabis modo dispositis. C. B. P. *The Chaste Tree*. Sp. 1.

Vitis Idæa, foliis oblongis crenatis, fructu nigricante. C. B. P. *Bilberry*. English, On *moory Heaths*. *Vaccinium*, Sp. 1.

Vitis vinifera. C. B. P. *The Vine*. Sp. 1.

Ulmaria. Clus. *Meadow sweet*, or *Queen of the Meadows*. English, In *moist Meadows*, and by the *Side of Ditches*. *Spiræa*, Sp. 12.

Urtica urens maxima. C. B. P. *Nettle*. English, By *Hedges and Banks*. Sp. 1.

Urtica urens, pilulas ferens prima Dioscoridis, semine lini. C. B. P. *The Roman Nettle*. Sp. 1.

Xanthium. Dod. *The Lesser Burdock*. Sp. 1.

Zea briza dicta, vel *Monoccos Germanica*. C. B. P. *Spelt*, or *St. Peter's Corn*.

A CATALOGUE of the large Trees which are admitted in the *London Dispensary*, as medicinal Plants, but generally grow too large to be admitted into small Gardens.

ABIES mas, conis sursum spectantibus. C. B. P. *The silver Fir.* Sp. 1.

Abies tenuiore folio, fructu deorsum inflexo. C. B. P. *The common, or Spruce Fir, or Pitch Tree.* Sp. 2.

Amygdalus fativa. C. B. P. *The Almond Tree.* Sp. 1.

Armeniaca fructu majore. Inst. R. H. *The Apricot.* Sp. 1.

Betula. C. B. P. *The Birch Tree.* English, *In Woods.* Sp. 1.

Castanea fativa. C. B. P. *The Chestnut Tree.* Sp. 1.

Cerasus major ac sylvestris, fructu subdulci, nigro colore inficiente. C. B. P. *The black Cherry.* English, *In Hedge-rows, and some Woods.* Sp. 2.

Cerasus fativa rotunda, rubra & acida. C. B. P. *The red Cherry.* Sp. 1.

Cydonia fructu oblongo læviori. Inst. R. H. *The Quince Tree.* Sp. 1.

Ficus communis. C. B. P. *The Fig Tree.* Sp. 1.

Fraxinus excelsior. C. B. P. *The Ash Tree.* English, *In Hedge-rows.* Sp. 1.

Fraxinus rotundior folio. C. B. P. *The Manna Ash.* Sp. 2.

Ilex aculeata cocciglanditer. C. B. P. *The Kermes Oak.* Quercus, Sp. 18.

Larix folio deciduo, conifera. J. B. *The Larch Tree.* Sp. 1.

Malus sylvestris, acido fructu albo. Inst. R. H. *The Crab-Tree.* English, *In Hedges.* Sp. 1.

Malus fativa. Raii Syn. *The Apple Tree.* Sp. 2.

Morus fructu nigro. C. B. P. *The Mulberry.* Sp. 1.

Nux juglans, sive regia vulgaris. C. B. P. *The Walnut.* Juglans, Sp. 1.

Persea molli carne, & vulgaris, viridis & alba. C. B. P. *The Peach Tree.* Sp. 1.

Pinus fativa. C. B. P. *The Pine Tree.* Sp. 2:

Pinus sylvestris. C. B. P. *The wild Pine, or Pinaster.* Sp. 1.

Populus nigra. C. B. P. *The black Poplar:* English, *In Hedge-rows.* Sp. 3.

Pyrus fativa. C. B. P. *The Pear Tree.* Sp. 1.

Quercus latifolia fœmina: C. B. P. *The Oak Tree.* English, *In Forests and Woods.* Sp. 1.

Salix vulgaris alba arborescens. C. B. P. *The Willow.* English, *By the Side of Rivers.* Sp. 1.

Suber latifolium, perpetuo virens. C. B. P. *The Cork Tree.* Quercus, Sp. 20.

Tilia fœmina, folio majore. C. B. P. *The Lime Tree.* Sp. 1.

Ulmus campestris & Theophrasti. C. B. P. *The Elm Tree.* English, *In Hedge-rows.* Sp. 3.

F I N I S.

Directions for the Binder to place the Cuts.

Vol. I.

Frontispiece to face the Title.

Plate 1, 2, 3, and 4 of Roots, to be placed at Sheet A, in the following Order, Plate 1, facing the first Page. Plate 2, facing the second. Plate 3, before the Third, and Plate 4, before the Fourth. The Plate of the Green House, at the Word Greenhouse, and the Plate of Leaves, at the Word Leaves.

Vol. II.

Polygala the first Page of I i. *Rubia* to front U u 2. The cold Stove and the arched Room to front the 3d Leaf of Sheet U u

Plates 3, 4, 5 and 6, to Front the fourth Leaf of U u.

Plate 1 and 2 of Stoves, to be placed in the middle of Sheet P pp

Frames to cover Melon Beds, the 2d Page of Q q q

Taiffon Press, the last Leaf of S 4. The great Press the first Leaf of T 4.

